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Message from IJERGS

This is the First Issue of the Seventh Volume of International Journal of Engineering Research and General Science. A total of 4 research articles are published and we sincerely hope that each one of these provides some significant stimulation to a reasonable segment of our community of readers.

In this issue, we have focused mainly on the Young Ideas. We also welcome more research oriented ideas in our upcoming Issues.

Author's response for this issue was really inspiring for us. We received many papers from many countries in this issue but our technical team and editor members accepted very less number of research papers for the publication. We have provided editors feedback for every rejected as well as accepted paper so that authors can work out in the weakness more and we shall accept the paper in near future.

Our team have done good job however, this issue may possibly have some drawbacks, and therefore, constructive suggestions for further improvement shall be warmly welcomed.

IJERGS Team,

International Journal of Engineering Research and General Science

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Antimmuno Protocol : A Novel Model for Security Concerns in Multi-hop IoT Routing

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Abstract—The aim of the proposed research model is to examine the a new technology for reducing security threats in multi-hop iot networks by using antigen and immunology principles. Various types of threats and the methods to counteract them has been discussed in the said research paper. Antigen uses special modules to counteract the malicious spywares and help in restoring the sound health of an IoT based network.

Keywords— Antigen, Immunology, Malware, IoT Security, Multi-hop routing, Jamming, Cloning,

1.INTRODUCTION

Internet of Things (IoT) has recently gained much of attention as the technology grows at a faster rate and is reaching the hands of billions. IoT would be the future of technology where M2M and D2D communication among smart devices would increase at a sharp rate. This paper addresses an security protocol technique where the systems are smart enogh to fight external threats in a similar manner analogous to the immune system of human body . [1]-[4]

2.TYPES OF THREATS IN MULTI-HOP IOT ROUTING

Sl No.	Type of Threat	Antimmunology in Causal Study
1	Evesdropping	Encryption applied prior to stealing by the attacker
2	Hyperactive	Applied especially in medical environment
3	Imitative	Alternation is done in holistic cleaning if the threat
4	Inneruptive	Attacker uses cloning the source, so anti-spoofing program is run
5	Routed-Diversive	Blind-signature based program is run by the group for restricting sensitive information
6	Blocked-Chain	Trojan worms are made to dissolve at the destination before the attack
7	Affricative	Jamming procedure is started by the source which secure the firewall
8	Congregative	Malicious malware are packed as bunched spam and disintegrated by cryptographic techniques.

Table -1 – Details of Various security threats and measures taken by the proposed system.

Security threats have been challenge for wireless systems. When we consider IoT there has been a tremendous increase in its application in recent years.

It is roughly estimated that by 2025 the devices using iot would be 2.5 billion. This creates and psychological impact on the programmers to device iot based solutions. When we consider the protocols for designing systems to make security attacks invincible, various protocols have been suggested.prop indication process for multi-hop IoT networks is a challenge which is overcome by using the immunology computer science principle. [5]-[8]

3.ANTIMMUNO PROTOCOL : COMBINATION OF ANTIGEN AND IMMUNOLOGY

STEPS	MULTI-HOP IOT ROUTING PARAMETERS	ANTIGEN PROTOCOL

1	**Website Module**	• Weaker passwords elimination is guaranteed.
2	**Encryption/Decryption**	• Implementation of strong password with special characters & numerals needed .
3	**Network-security Services**	• Fuzz flow minimization.
4	**Transportation Cryptology**	• End-to-End encryption for D2D communication.
5	**Authorization Concern**	• Customer return feedback at user level is obtained.
6	**Cloud-security Networking**	• Defenseless structures of API are highly reduced.
7	**Mobile-security Networking**	• Week pass-codes of mobile is re-written by device
8	**Insufficient Security Configurability**	• Extending passwords to 32 characters after authentication access.
9	**Firmware of D2D/M2M**	• Dynamically updating of existing applications to suit antigen protocol.
10	**Physical point-to-point security**	• External I/O hardware ports control on hand-held devices like USB-ports.

Table – 2 – Addressing multi-hop IoT routing by Antigen Protocol.

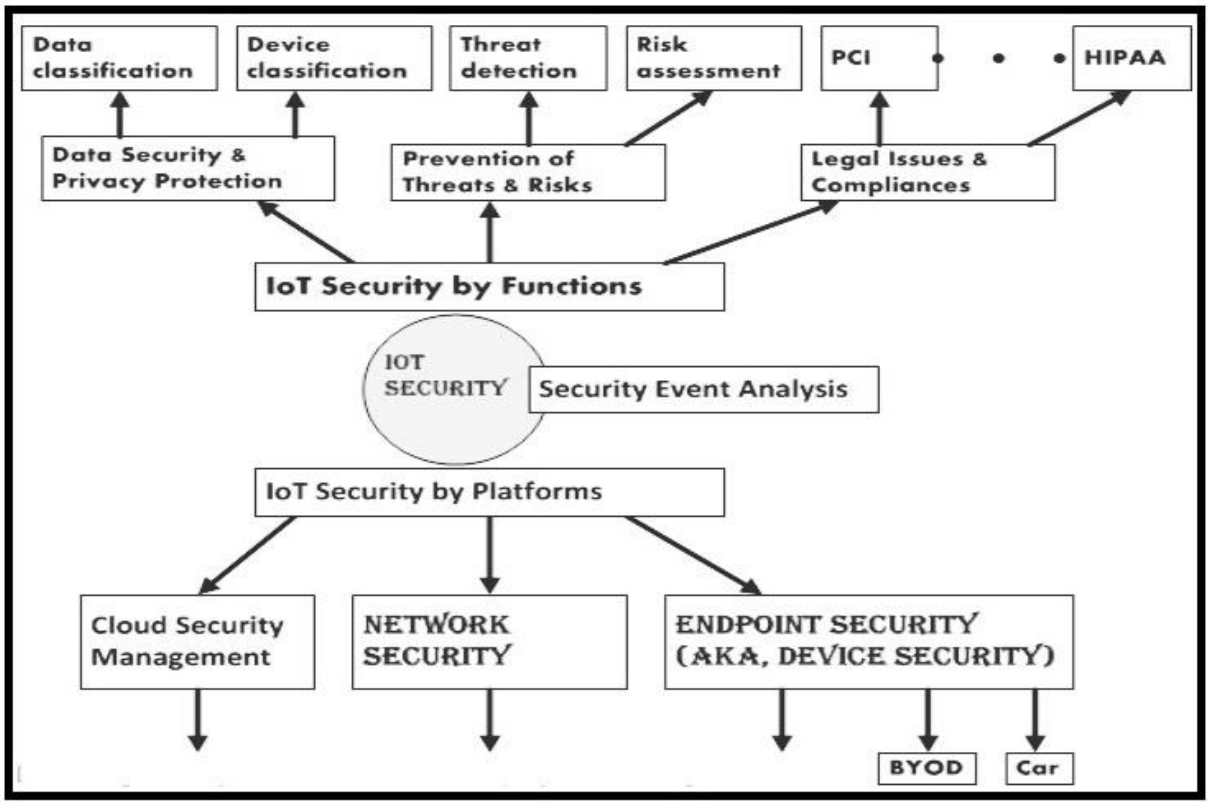

Figure 1- Summary of IoT Security Event Analysis.

Antigen : It is aspecial protocol designed to ensure thee smart behavior of the network , and develop a self-fighting strategy to the threat.

Immunology:

STEPS	MULTI-HOP IOT ROUTING PARAMETERS	IMMUNOLOGY PROTOCOL
1	**Website Module**	Utilizing new dynamic languages like Kotlin in device depended platforms similar to amazon web services (AWS)
2	**Encryption/Decryption**	Cloud computing assisted error correction based on deep learnling
3	**Network-security Services**	Filling proper stacked layer-to-layer open source interconnection at network level
4	**Transportation Crptology**	Enabling superlative encryption on the basis of source request
5	**Authorization Concern**	Hyper-interactive domain name server (DNS) for self-correcting firewall hacks
6	**Cloud-security Networking**	Iterative repeat request (IRQ) levels set by the cloud security provider.
7	**Mobile-security Networking**	OTP based password resetting in portable device appliances (PDAs)
8	**Insufficient Security Configurability**	Fingerprint based Biometric authentication in smart hand-held devices (SHHDs)
9	**Firmware of D2D/M2M**	Confutative hardware-interfacing in near-field cellular integrated networks .
10	**Physical point-to-point security**	Anti-Malware self-repetitive iteration initiated as soon as the threat is detected at primary source.

Table – 3 – Addressing multi-hop IoT routing by Antigen Protocol.

Steps to be followed in Antimmuno protocol in counteracting security threats in multi-hop IoT networks must include scalability in testing, holistic edged technology and smart encryption in primary stage. The secondary stage must inculcate system versatility, full-life likelihood algorithm based support . This large haul weakens the attackers trying to break the barrier with explicit ownership

6. SCOPE FOR REAL-TIME APPLICATION

Immunology protocol uses fair-usage mechanism for establishing safe techniques of malware detection. The security threats in an unambiguous environment could be detected by self correcting structure of the intelligent network. The future indices that may be used for its advanced application are D2M (Devices to Machine), CISCOT (Internet of Thing based CISCO systems , WSW (World Size Web). The services must be consumer oriented, economical and user-friendly.

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Experimental Study of Replacement of Cement by Bagasse Ash with steel fibers

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Abstract— Aim of the project is to utilize the waste product bagass ash produced by agricultural industry and enhancement of concrete strength by using steel fiber. Sugarcane bagasse ash (SCBA) is a left-over industrial west product which is used as a replacement of cement. Sugarcane bagasse ash has high content in silica. Using of Sugarcane bagasse ash in concrete is a remarkable possibility for economy and conservation of natural resources. One of the important properties of steel fiber reinforced concrete is its superior resistance to cracking. As a result of this ability to arrest cracks, fibers are able to hold the matrix together even after extensive cracking. In this project Sugarcane bagasse ash has been partially replaced with cement in the ratio of 0%, 5%, 10%, 15% and 20% by the weight of cement in M60 Grade concrete. From the test results optimum percentage of Sugarcane bagasse ash has achieved on steel fiber reinforced concrete.

Keywords– Bagasse Ash, concrete, Crimped steel fiber, partial replacement, Compressive strength, flexural strength, Split tensile strength.

Introduction

There are many Innovations are developing world wide to control and regulate the management of sub-products, residuals and industrial wastes in order to preserve the environment from contamination. A good solution to the problem of recycling of agro industrial residue would be by burning them in a controlled environment and use the ashes (waste) for more noble means. Utilization of such wastes as cement replacement materials may reduce the cost of concrete production and also minimize the negative environmental effects with disposal of these wastes.

Sugarcane is one of the major crops grown in over 110 countries and its total production is over 1500 million tons. After the extraction of all economical sugar from sugarcane, large fibrous residue is obtained. When bagasse is burnt in the boiler of cogeneration plant under controlled conditions, reactive amorphous silica is formed due to the combustion process and is present in the residual ashes known as Sugarcane Bagasse Ash. This amorphous silica content makes bagasse ash a useful cement replacement material in concrete. Each ton of sugarcane generates approximately 20% of bagasse (at a moisture content of 50%) and 0.62% of residual ash. The residue after combustion presents a chemical composition dominates by silicon dioxide (SiO2). In this study the bagasse ash is planned to use as the partial replacement for cement in order to utilize the wastages and to protect the environment from the hazards. Sugarcane bagasse ash is normally used as fertilizer in sugarcane plantation.

Concrete is characterized by brittle failure, the nearly complete loss of loading capacity, once failure is initiated. This can be overcome by the inclusion of a small amount of short randomly distributed fibers (steel, glass, synthetic and natural). Steel fiber reinforced concrete has the ability of excellent tensile strength, flexural strength, shock resistance, fatigue resistance, ductility and crack arrest. Therefore, it has been applied abroad in various professional fields of construction, irrigation works and architecture. There are currently 300,000 metric tons of fibers used for concrete reinforcement. Steel fiber remains the most used fiber of all (50% of total tonnage used).

NEED AND ADVANTAGES

Need of Sugarcane Bagasse Ash (SCBA) Usage

1. Each ton of cement produces approximately about one ton of CO_2 and cement.
2. Brings positive effect to the environment.
3. When used as replacement for cement in concrete, it reduces the problem associated with their disposal.
4. Decrease in the emission of greenhouse gases. Construction industry is responsible for the emission of About 5% of CO_2 worldwide.

Need of steel fiber

Steel fibers will enhance hardened state properties of structural concrete. Additionally, they are often used to replace or supplement structural reinforcement. Essentially, fibers act as crack arrester restricting the development of cracks and thus transforming an integrally brittle matrix, i.e. cement concrete with its low tensile and impact resistances, into a strong composite with superior crack resistance, improved ductility and distinctive post-cracking behavior prior to failure.

Advantages

1. The ash disposal problem from sugar industry is reduced since it is usually disposed of in open land area.
2. Due to partial replacement of cement in concrete results, overall price involved in the construction is reduced.
3. Steel fibers are employed as an additive to the concrete in order to increase the energy absorption capacity and to control the crack development. It is advantageous in seismic resistant structures.

EXPERIMENTAL INVESTIGATION

In this experimental work, a total of 96 numbers of concrete samples were casted. The typical size of cube 150mm×150mm×150mm is used. The mix design (procedure) of concrete was done according to Indian Standard guidelines for M60 grade. To achieve optimum value of SCBA on steel fiber reinforced concrete tests were divided into two parts. In first part optimum value of SCBA was founded from normal concrete. For that, concrete specimens were casted with partial replacement of sugarcane bagasse ash as 0%, 5%, 10%, 15% and 20% by the weight of cement. In second part optimum percent of steel fiber was founded from SCBA concrete. In that optimum value of SCBA replacement kept as fixed and crimped type steel fiber is added 0, 0.5%, 1% and 1.5% by the volume fraction of concrete were estimated. The ingredients of concrete were thoroughly mixed in mixer machine till uniform consistency was achieved. Before casting, machine oil was smeared on the inner surfaces of the cast iron mould. Concrete was poured into the mould and compacted carefully using table vibrator. The top surface was over by means of a trowel. The specimens were removed from the mould after 24hours and then cured under water for a period of 7 and 28 days. The samples were taken out from the curing tank just prior to the test. The compressive test was conducted using a 1000kN capacity compression testing machine. This test was lead as per the relevant Indian Standard specifications.

MATERIAL PROPERTIES

Cement

The cement used in this study was OPC 53 grade from Dalmia Cement Company which is widely used in the Construction industries and it conforming as per IS 12269-1987.

Table 1: Physical properties of cement

PROPERTY VALUE	VALUE
Specific Gravity	3.15
Standard consistency	32.5%
Setting time	-
i) Initial setting time	`45 min.
(ii) Final setting time	330 min.

Table 2: Chemical composition of cement

COMPONENT	%
SiO_2	21.8
Al_2O_3	4.8
Fe_2O_3	3.8
CaO	63.3
SO_3	2.2
MgO_3	0.9
Na_2O	0.21
K_2O	0.46
Cl	0.04
P_2O_5	<0.04
Loss of ignition	2
Insoluble residue	0.4

Fine Aggregate

Aggregates for the concrete were obtained from approved suppliers conforming to the specifications of IS 383 - 1970 and were chemically inactive (inert), spotless and robust. The fine aggregate was tested as per the limits which is specified in IS: 2386 (Part- 3):1963. In this study, fine aggregate having a fineness modulus of 2.46 which is carried out by using sieve analysis and it confirming to zone 3.

Table 3 : Physical properties of Fine aggregate

PROPERTY	VALUE
Specific gravity	2.65
Fineness modulus	2.46
Type of sand	River sand
Sand confirming zone	Zone III (Medium sand)

Coarse Aggregate

Coarse aggregates will be machine-crushed one of black trap or equivalent black tough stone and shall be stiff, robust, dense, durable, spotless or procured from quarries approved by the consultant. In this study, crushed aggregate of size 20 mm in angular shape is used and it conforming to IS 383-1970.

Table 4 : Properties of Coarse Aggregate

PROPERTY VALUE	VALUE
Specific gravity	2.67
Fineness modulus	7.682
Impact value	22.12%
Crushing value	24.44%

Sugarcane Bagasse Ash

It comprises high volume of sio_2. Therefore, it is classified as a good pozzolanic material. SCBA can be used as an add-on for cementitious material due to its pozzolanic property.

Table 5 : Physical properties of Sugarcane Bagasse Ash

PROPERTY	VALUE
Fineness modulus	2.12
Specific gravity	1.78

Table 6 : Chemical composition of Sugarcane Bagasse Ash

OXIDES	SCBA MASS %
Silica (SiO_2)	68
Alumina (Al_2O_3)	3.05
Ferric Oxide (Fe_2O_3)	3.72
Calcium Oxide (CaO)	5.1
Magnesium Oxide (MgO)	1.15
Sulfur Tri Oxide (SO_3)	0.67
Loss of Ignition	4.5

Water

Good potable water available in the site is used for the construction purpose which conforming to the requirements of water for concreting and curing as per IS: 456-2009.

Steel fiber

Steel fiber used in this study was crimped type steel fiber. Photograph of this fiber is shown in Fig.1. Properties of fiber are shown in Table 6. Fibers were placed randomly oriented into the concrete.

Table 7 : Properties of steel fiber

PROPERTY	VALUE
Length	30mm
Cross sectional diameter	1mm
Undulation width	2mm
Aspect ratio	50

RESULTS AND DISCUSSION

Compressive strength test

Compressive strength was done for the cube samples of size 150 mm x 150 mm x 150 mm. During first part of test concrete cubes were casted with partial replacement of cement with sugarcane bagasse ash as 0%, 5%, 10%, 15% and 20% and it was verified at the age of 7 and 28 days. The test results are plotted in the graph as shown in the Fig. Bellow.

Compressive strength constantly increases as the curing period goes on increasing. Maximum compressive strength achieved on 15% replacement of SCBA. In which compressive strength is 73.66 Mpa when cement replaced by bagass ash with 20% amount.

Sr.No	SCBA %	COMPRESSIVE STRENGTH IN MPa	
		7 day's	28 day's
1	0	47	67
2	5	48.33	68.33
3	10	50.11	70.11
4	15	53.22	73.66
5	20	44.33	64.77

At second of part test concrete cubes were casted with optimum value of 15% replacement SCBA kept as constant and crimped type steel fiber is added 0, 0.5%, 1% and 1.5% by the volume fraction of concrete. It was verified at the age of 7 and 28 days. The test results given bellow.

Sr.No	% of steel fiber	COMPRESSIVE STRENGTH IN MPa	
		7 day's	28 day's
1	0	49.5	68.80
2	0.5	50.66	7033
3	1	52.44	74.50
4	1.5	51.80	70.40
5	2	46.11	66.60

From the test results maximum compressive strength was achieved on 1% addition of steel fiber. In which compressive strength is 74.50% on SCBA concrete with Steel fiber.

Split tensile strength test

Split tensile test was done on cylinder specimens of size 150 mm in diameter and 300 mm in length. The cylinder specimen with partial replacement was done which carried out as same as the compressive strength and it is verified at the age of 28 days. The spilt tensile strength test results of normal concrete for different % of SCBA are shown bellow.

Sr.No	SCBA %	SPLIT TENSILE STRENGTH IN MPa	
		7 day's	28 day's
1	0	2.53	3.52
2	5	2.67	3.76
3	10	3.11	3.91
4	15	3.25	4.14
5	20	2.68	3.48

Spilt tensile strength of concrete goes on increasing by increase in SCBA up to the optimum value. The optimum value of SCBA content was found to be 15%. Due to SCBA replacement spilt tensile strength is 4.14Mps

The spilt tensile strength test results of SCBA concrete for different % of steel fiber are shown bellow.

Sr.No	% of steel fiber	SPLIT TENSILE STRENGTH IN MPa	
		7 day's	28 day's
1	0	2.68	3.82
2	0.5	2.77	3.98
3	1	3.28	4.30
4	1.5	2.92	3.92
5	2	2.1	3.28

From the test results maximum Spilt tensile strength was achieved on 1% addition of steel fiber is 4.30 Mpa

Flexural strength test

Flexural strength test was done on beam specimens of size 100 mm X 100 mm X 500 mm. The beam specimen with partial replacement was done which carried out as same as the compressive strength and it is verified at the age of 28 days. The flexural strength test results of normal concrete for different % of SCBA are shown bellow.

Sr.No	SCBA %	FLEXURAL STRENGTH IN MPa	
		7 day's	28 day's
1	0	4.2	6.3
2	5	4.46	7.18
3	10	4.66	7.66
4	15	4.78	8.38
5	20	3.76	6.1

It was founded that, at the age of 28 days, maximum flexural strength was obtained at 15% replacement of SCBA is 8.38Mpa.

The flexural strength test results of SCBA concrete for different % of steel fiber are shown bellow.

Sr.No	% of steel fiber	FLEXURAL STRENGTH IN MPa	
		7 day's	28 day's
1	0	4.50	6.60
2	0.5	4.76	7.38
3	1	4.84	8.96
4	1.5	5.1	7.53
5	2	4.1	6.4

From the test results maximum flexural strength was achieved on 1% addition of steel fiber is 8.96 Mpa.

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CONCLUSION

From this experiments and research work the following facts are drawn

- The compressive strength of sugar cane baggas ash concrete M60 Grade is comparatively higher than that of Normal control mix
- The compressive strength of sugar cane baggas ash concrete M60 Grade is comparatively greater which is 73.66Mpa and it also increases with addition of 1% of steel fiber, its compressive strength after addition of steel fiber is 74.50 Mpa.
- Spilt tensile strength of sugar cane baggas ash concrete M60 Grade is comparatively greater which is 4.14Mpa and it also increases with addition of 1% of steel fiber, its Spilt tensile strength after addition of steel fiber is 4.30 Mpa
- flexural strength of sugar cane baggas ash concrete M60 Grade is comparatively greater which is 8;38Mpa and it also increases with addition of 1% of steel fiber, its Spilt tensile strength after addition of steel fiber is 8.96 Mpa
- So finally we conclude that we are able to replace cement by 15 % baggas ash.

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SIMULATION OF CONTROL CHANNELS FOR LTE NETWORKS

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Abstract-There has been evolution of mobile technologies from 3G to 4G in the past few years.System level simulations is crucial in the evaluation of performance of new mobile technologies. . They aim at determining at what level predicted link level gains impact the network performance. This paper presents a MATLAB computationally efficient LTE (Long Term Evaluation) control channel simulator. LTE is a standard specified by the 3rd Generation Partnership Project.(3GPP).LTE offers improvement over UMTS and HSPA. In LTE, physical layer conveys data and control information b/w eNodeB & UE (User Equipment).Simulator is used to simulate the physical broadcast channel (PBCH) of LTE system. This physical channel carries information for UEs requiring to access the network.

Keywords: 3G, 4G, LTE, Controlchannel, PBCH, enodeB, UE

INTRODUCTION

With the advent of Internet and wireless communication mobile data services are undergoing a tremendous growth. First generation (1G) mobile phones had only voice facility. These were replaced by second generation (2G) digital phones with added fax, data and messaging services. The third generation (3G) technology has added multimedia facilities to 2G phones.3G has paved way to 4G with more advanced features.In order to evaluate the performance of new mobile technologies system level simulations are required. The main objective of the paper is to simulate the physical broadcast channel (PBCH) for LTE (Long term evaluation networks) networks.

LTE SIMULATION

In the development and standardization of LTE, as well as the implementation process of equipment manufacturers, simulations are necessary to test and optimize algorithms and procedures. This has to be performed on both, the physical layer (link-level) and in the network (system-level) context. While link-level simulations allow for the investigation of issues such as Multiple-Input Multiple-Output (MIMO) gains, Adaptive Modulation and Coding (AMC) feedback, modeling of channel encoding and decoding or physical layer modeling for system-level, system-level simulations focus more on network-related issues such as scheduling, mobility handling or interference management. The LTE system-level simulator supplements an already freely-available LTE link-level simulator. This combination allows for detailed simulation of both the physical layer procedures to analyze link-level related issues and system-level simulations where the physical layer is abstracted from link level results and network performance is investigated. The LTE system-level simulator implementation offers a high degree of flexibility. For the implementation, extensive use of the Object-oriented programming (OOP) capabilities of MATLAB, introduced with the 2010a Release has been made. Having a modular code with a clear structure based in objects results in a much more organized, understandable and maintainable simulator structure in which new functionalities and algorithms can be easily added and tested

OVERVIEW OF SIMULATOR

While link-level simulations are suitable for developing receiver structures, coding schemes or feedback strategies, it is not possible to reflect the effects of issues such as cell planning, scheduling, or interference using this type of simulations. Simulating the totality of the radio links between the User Equipments (UEs) and eNodeBs is an impractical way of performing system level simulations due to the vast amount of computational power that would be required. Thus, in system-level simulations the physical layer is abstracted by

simplified models that capture its essential characteristics with high accuracy and simultaneously low complexity.Fig 1 depicts a schematic block diagram of the LTE system-level simulator. Similar to other system-level simulators, the core part consists of a link measurement model and a link performance model

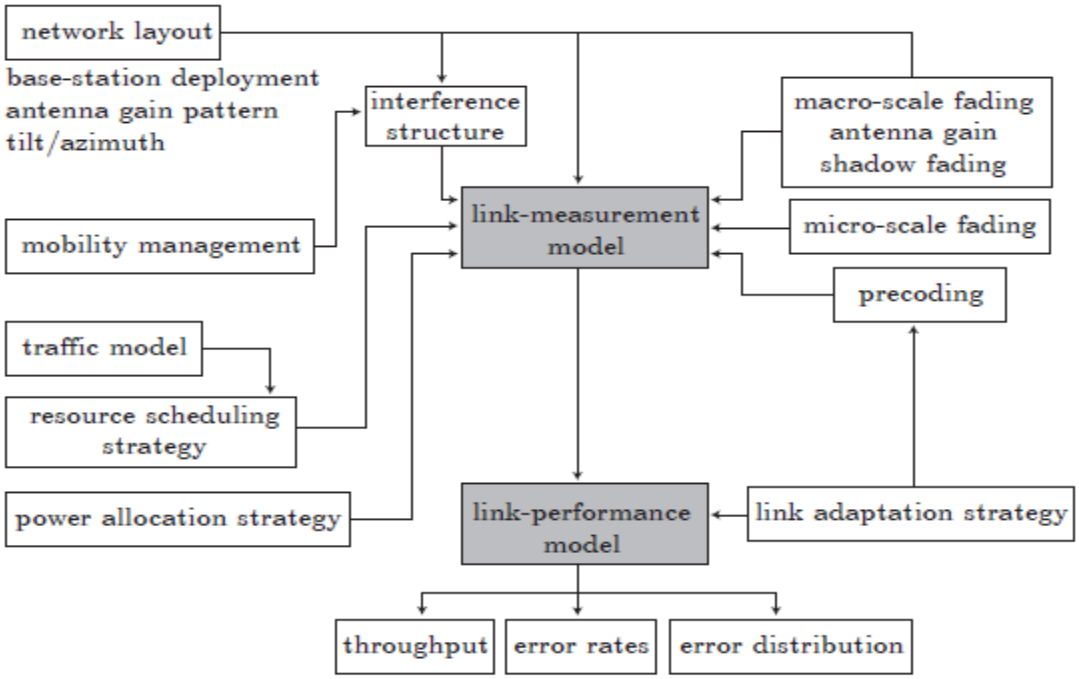

Fig 1: Schematic block diagram of LTE Simulator

The link measurement model abstracts the measured link quality used for link adaptation and resource allocation. On the other hand the link performance model determines the link Block Error Ratio (BLER) at reduced complexity's figures of merit, the simulator outputs traces containing throughput and error rates, from which their distributions can be computed. Implementation-wise, the simulator flow follows the pseudo-code below. The simulation is performed by defining a Region Of Interest (ROI) in which the enodeBs and UEs are positioned and a simulation length in Transmission Time Intervals (TTIs). It is only in this area where UE movement and transmission of the Downlink Shared Channel (DLSCH) are simulated.

RUNNING A SIMULATION

The main file of the LTE Link Level Simulator is LTE_sim_main.m, though you may normally run the simulation through a batch file such as LTE_sim_launcher.m, which performs the following tasks:

- Loading a configuration file of choice
- Executing the LTE_sim_main.m main simulation file.

SIMULATION RESULTS

BLER V/S SNR CURVES

Block Error Rate (BLER) is used in LTE/4G technology to know the in-sync or out-of-sync indication during radio link monitoring (RLM).BLER (in LTE) = No of erroneous blocks / Total no of Received Blocks. Normal in-sync condition is 2% of BLER and for out-of-sync 10%.SNR refers to the signal to noise ratio.

The UE sends CQI feedback as an indication of the data rate which can be supported by the downlink channel. This helps the eNodeB to select appropriate modulation scheme and code rate for downlink transmission. The UE determines CQI to be reported based on measurements of the downlink reference signals. The UE determines CQI such that it corresponds to the highest Modulation and Coding Scheme (MCS) allowing the UE to decode the transport block with error rate probability not exceeding 10%.The CQI report not only indicates the downlink channel quality but also takes the capabilities of the UE's receiver into account. A UE with receiver of better quality can report better CQI for the same downlink channel quality and thus can receive downlink data with higher MCS. Table 1 shows modulation scheme, code rate along with efficiency for various CQI index

Table 1:CQI INDEX

CQI Index	Modulation	Code Rate X 1024	Efficiency
0	No transmission		
1	QPSK	78	0.1523
2	QPSK	120	0.2344
3	QPSK	193	0.3770
4	QPSK	308	0.6016
5	QPSK	449	0.8770
6	QPSK	602	1.1758
7	16QAM	378	1.4766
8	16QAM	490	1.9141
9	16QAM	616	2.4063
10	64QAM	466	2.7305
11	64QAM	567	3.3223
12	64QAM	666	3.9023
13	64QAM	772	4.5234
14	64QAM	873	5.1152
15	64QAM	948	5.5547

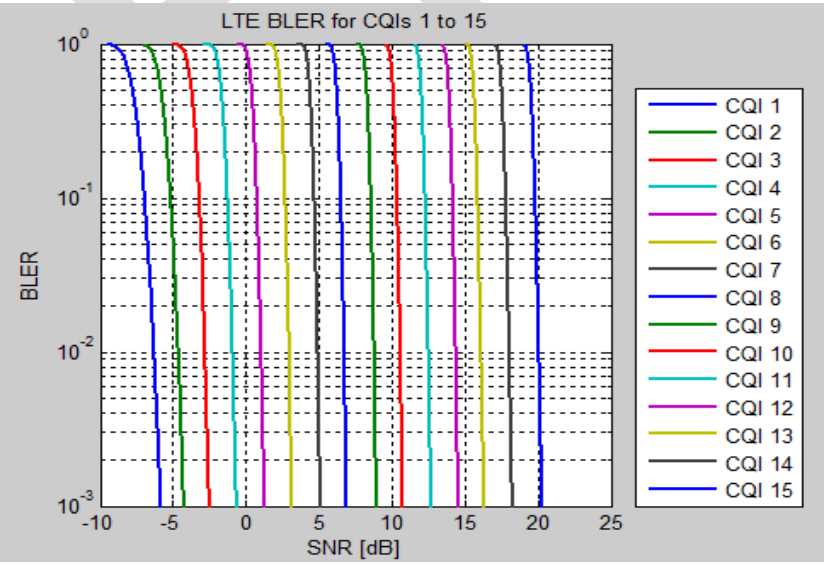

Fig 2: Fig 2 shows the BLER v/s SNR plots for the 15LTE CQI indices

SNR-CQI MAPPING PLOT

Before full commercial deployment of LTE, downlink SNR to CQI mapping for different multiple antenna techniques can be of enormous significance for the operators. Such vital RF parameters should be tuned before full-fledged commercial launch. In LTE, Adaptive Modulation and Coding (AMC) has to ensure a BLER value smaller than 10%. The SNR-to-CQI mapping is required to achieve this goal. Fig 3 shows SNR-CQI mapping plot for 10% BLER.

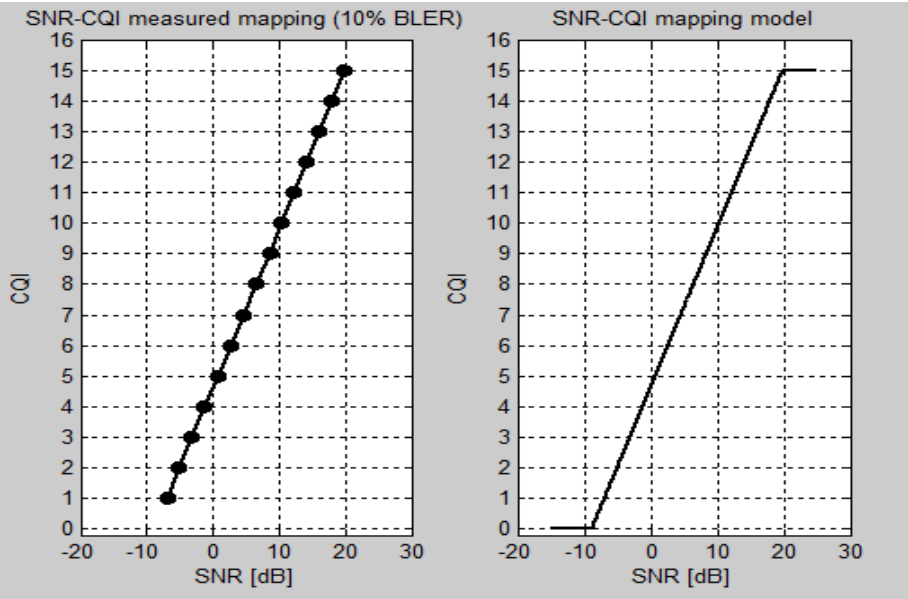

Fig 3: SNR-CQI mapping plot

ANTENNA GAIN PLOT

Antenna gain is usually defined as the ratio of the power produced by the antenna from a far-field source on the antenna's beam axis to the power produced by a hypothetical lossless isotropic antenna, which is equally sensitive to signals from all directions. Usually this ratio is expressed in decibels, and these units are referred to as "decibels-isotropic" (dBi). An alternate definition compares the antenna to the power received by a lossless half-wave dipole antenna, in which case the units are written as dBd. Since a lossless dipole antenna has a gain of 2.15 dBi, the relation between these units is: gain in dBd = gain in dBi - 2.15 dB . For a given frequency the antenna's effective area is proportional to the power gain. An antenna's effective length is proportional to the square root of the antenna's gain for a particular frequency and radiation resistance. Due to reciprocity, the gain of any antenna when receiving is equal to its gain when transmitting. Directive or directivity is a different measure which does not take an antenna's electrical efficiency into account. This term is sometimes more relevant in the case of a receiving antenna where one is concerned mainly with the ability of an antenna to receive signals from one direction while rejecting interfering signals coming from a different direction.The antenna gain is always maximum when $\theta=0^0$.Fig 4 shows antenna gain versus the angular position in degrees.

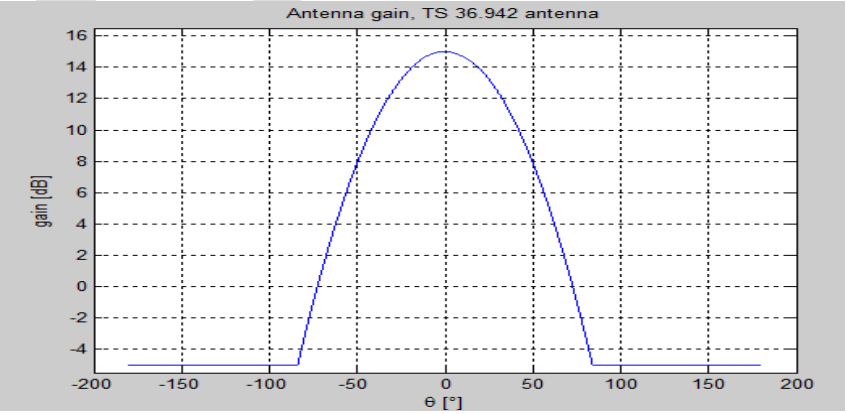

Fig 4: Antenna gain plot

MACROSCOPIC PATHLOSS V/S DISTANCE PLOT

The purposes of macroscopic modeling provide a means for predicting path loss for a particular application environment.

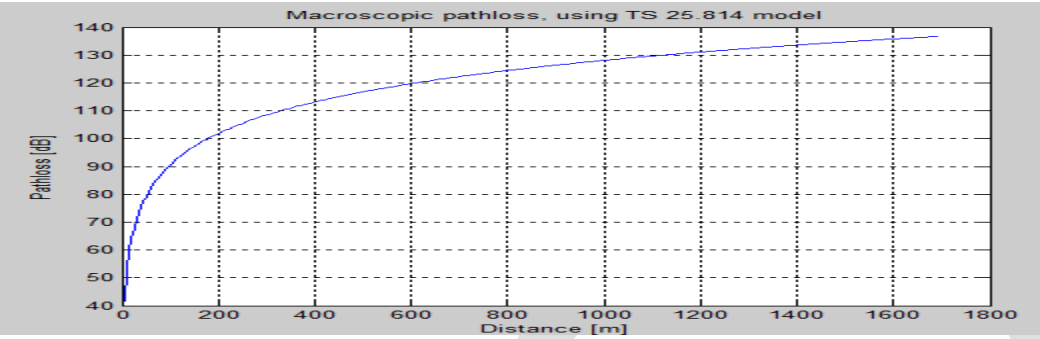

Fig 5 Macroscopic path loss v/s distance

Any individual path-loss model has a limited range of applicability and will provide only an approximate characterization for a specific propagation environment. Fig 9.4 shows the plot for macroscopic path loss versus distance. Path loss increases with distance as shown in Fig 5.

MACROSCOPIC PATHLOSS FOR DIFFERENT ENODEBS

Fig 6 shows the macroscopic path loss in dB for 3 eNodeBs in sector 1.The path loss is indicated in various colors on a scale starting from 70 with different x and y positions

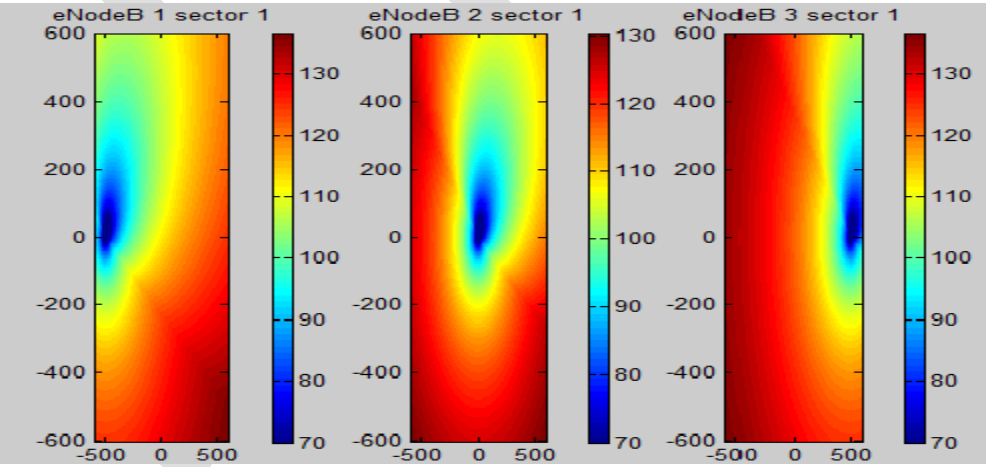

Fig 6: Macroscopic path loss for enodeBs in sector1

Fig 7 shows the macroscopic path loss in dB for 3 enodeBs in sector 2.The path loss is indicated in various colors on a scale starting from 70 with different x and y positions

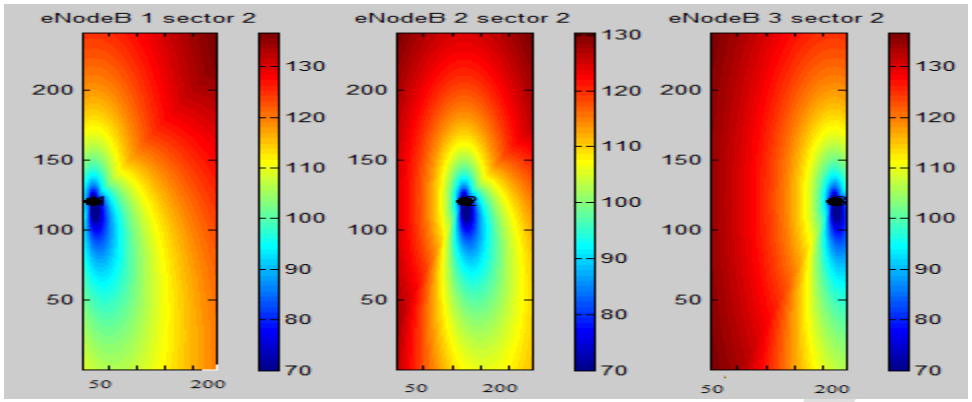

Fig 7: Macroscopic path loss for enodeBs in sector2

Fig 8 shows the macroscopic path loss in dB for 3 enodeBs in sector 3.The path loss is indicated in various colors on a scale starting from 70 with different x and y positions.

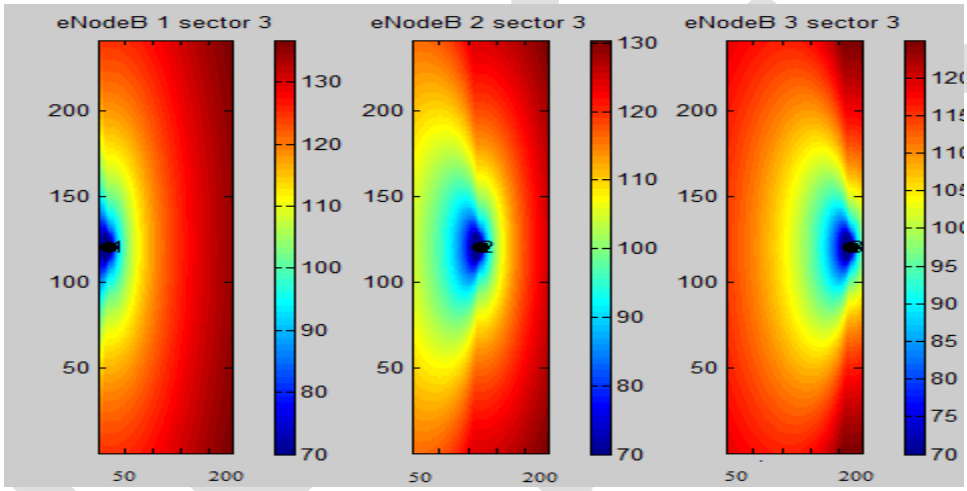

Fig 8: Macroscopic path loss for enodeBs in sector3

SHADOW FADING FOR DIFFERENT ENODEB'S

Shadow fading is a phenomenon that occurs when a mobile moves behind an obstruction and experiences a significant reduction in signal power. Path loss is a function only of parameters such as antenna heights, environment and distance. In practice, the particular clutter (buildings, trees) along a path at a given distance will be different for every path. Some paths will suffer increased loss; whereas others will be less obstructed and have increased signal strength. Fig 9 shows shadow fading for the 3 enodeBs.

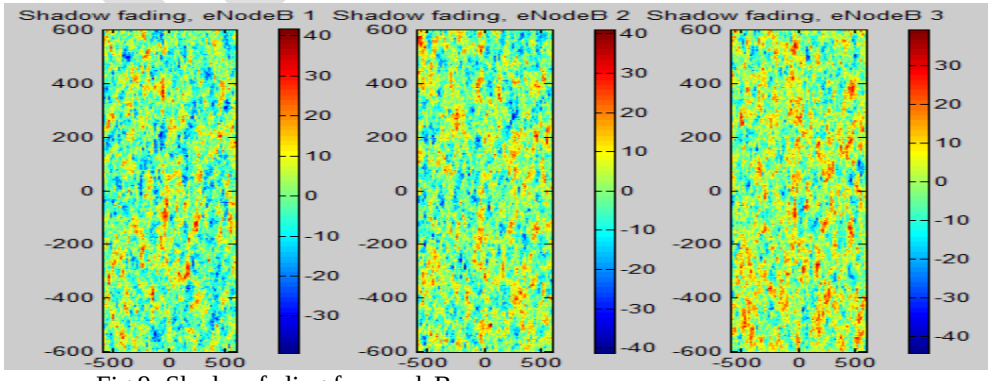

Fig 9: Shadow fading for enodeBs

UE AND ENODEB POSITIONS

Fig 10 shows the UE positions with respect to eNodeBs.The 3 enodeBs are indicated in red color. The UE's move from enodeB2 in different directions. The handoff occurs between different UE's and enodeBs as they move.

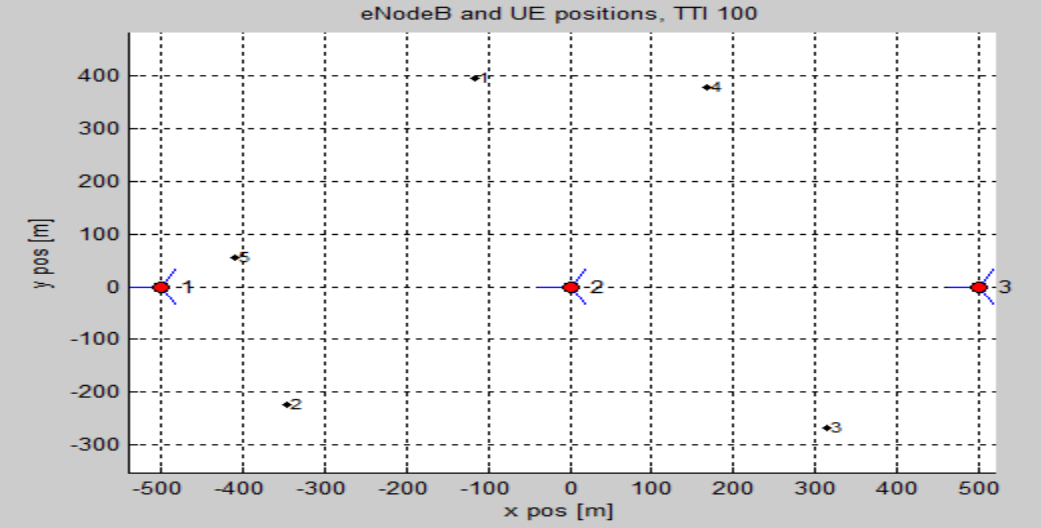

Fig 10: enodeBs and UE positions

UE INITIAL POSITION

Fig 11 shows the initial UE position, the 3 enodeBs in 3 sectors.

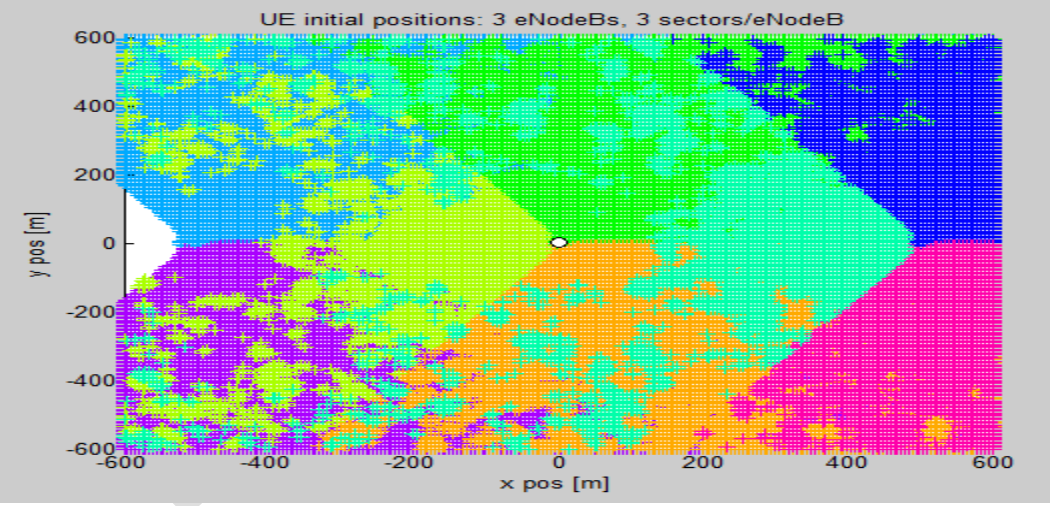

Fig 11: UE positions

MACROSCOPIC AND SHADOW FADING

The simulation is performed by defining a Region Of Interest (ROI) in which the enodeBs and UEs are positioned and a simulation length in Transmission Time Intervals (TTIs). It is only in this area where UE movement and transmission of the Downlink Shared Channel (DLSCH) are simulated. Sector SINR, calculated with distance dependent macro scale path loss and additional lognormal-distributed space-correlated shadow fading is shown in Fig 12

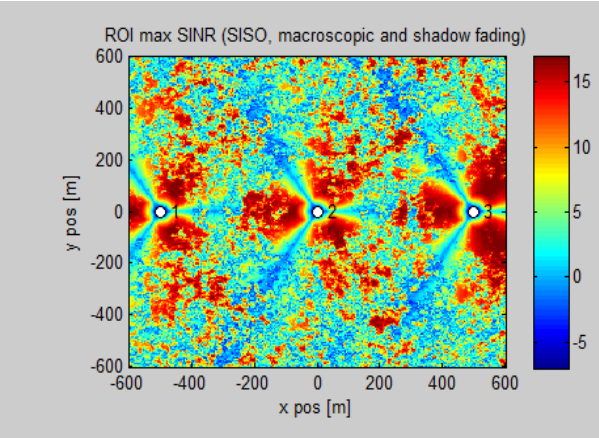

Fig `12: ROI max SINR (macroscopic and shadow fading)

Target sector CQIs calculated with distance dependent macro scale path loss and additional lognormal-distributed space-correlated shadow fading is shown in Fig 13

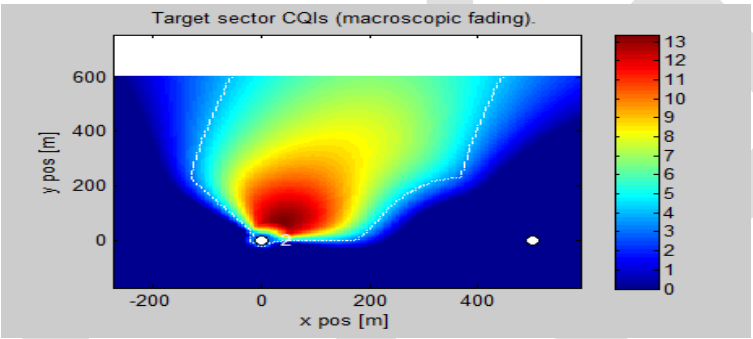

Fig 13: Target sector CQI (macroscopic and shadow fading)

SINR difference calculated with distance dependent macro scale path loss and additional lognormal-distributed space-correlated shadow fading is shown in Fig 14

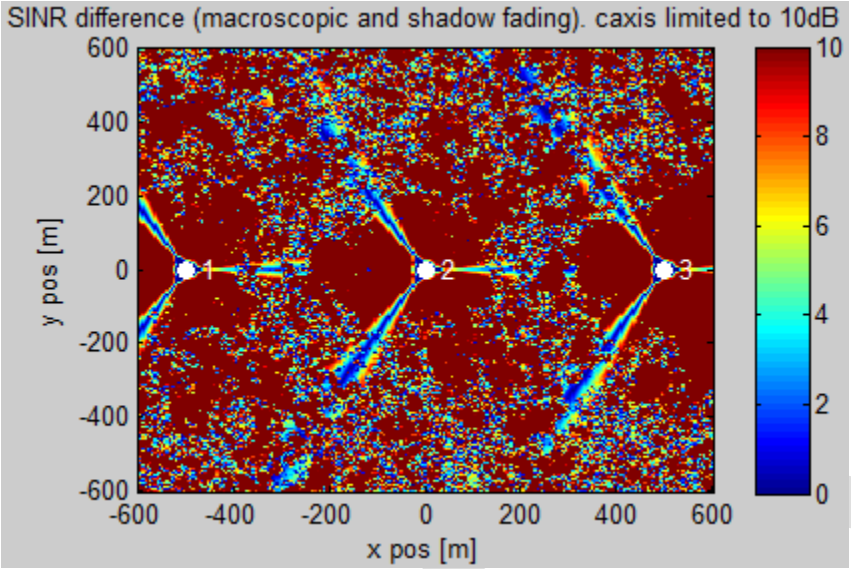

Fig 14: SINR difference (macroscopic and shadow fading)

The cell and sector assignment distance dependent macro scale path loss and additional lognormal-distributed space-correlated shadow fading is shown in Fig 15

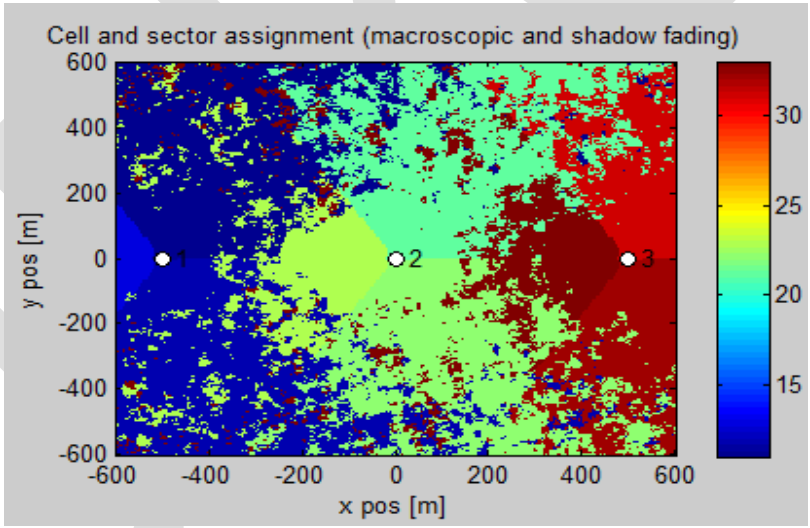

Fig 15: Cell and sector assignment (macroscopic and shadow fading)

Sector SINR, calculated with distance dependent macro scale path loss is shown in Fig 16

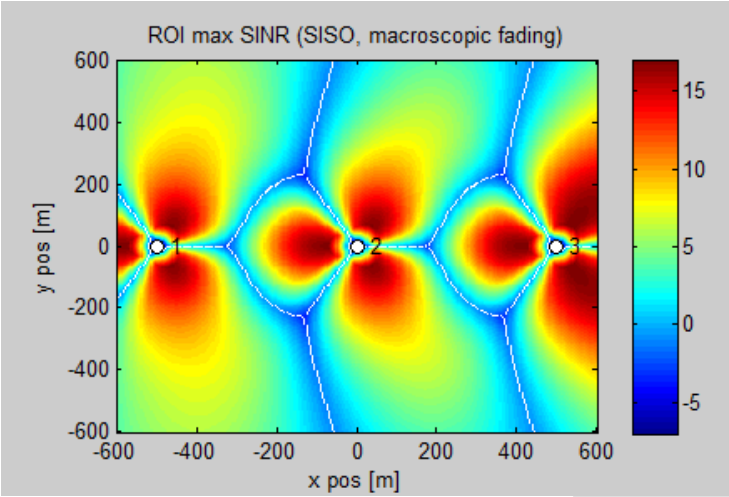

Fig 16 ROI max SINR (macroscopic fading)

TARGET SECTOR SINR CDF

Target sector CQIs calculated with distance dependent macro scale path loss is shown in Fig 17

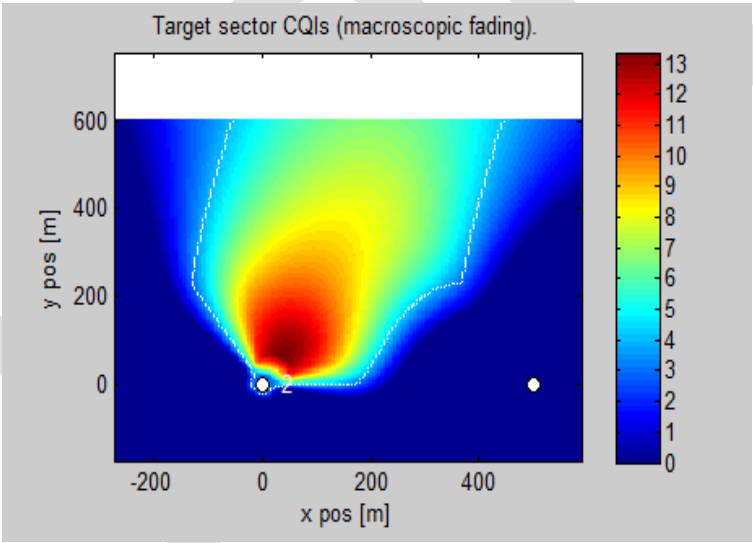

Fig 17 Target sector CQIs (macroscopic fading)

SINR difference calculated with distance dependent macro scale path loss is shown in Fig 18

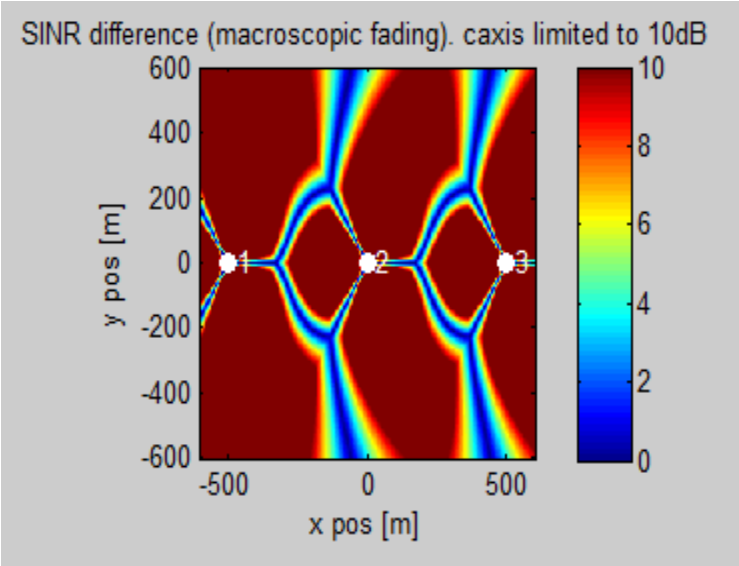

Fig 18 SINR difference (macroscopic fading)

Cell and sector assignment calculated with distance dependent macro scale path loss is shown in Fig 19

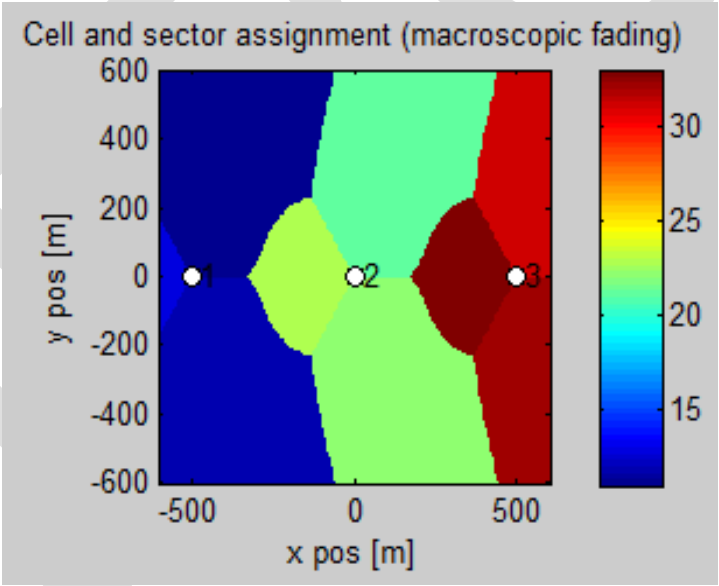

Fig 19: Cell and sector assignment (macroscopic fading)

TARGET SECTOR SINR CDF

Fig 20 shows a plot of target sector SINR as a cumulative distributive function. The continuous line shows SINR CDF for macro and shadow fading. The dotted lines show the SINR CDF of macro fading only.

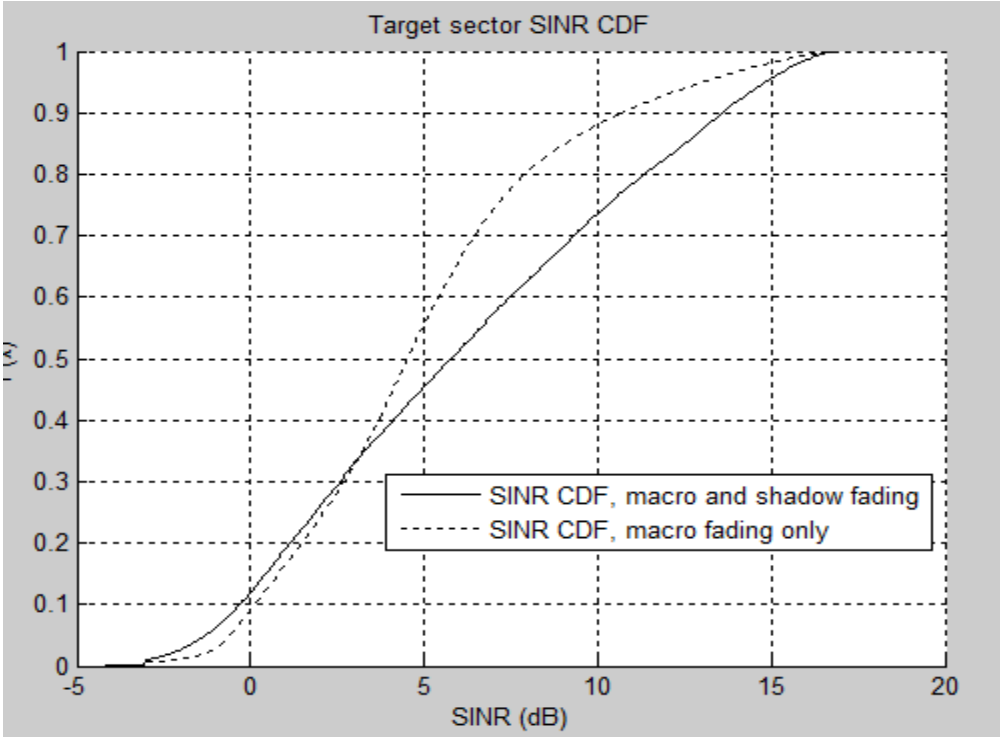

Fig 20: Target sector SINR CDF

CONCLUSION

The LTE Simulator has been used to simulate control channels of LTE network. The main purpose of this tool is to assess the network performance. Testing Fractional Frequency Reuse (FFR) strategies implemented at the scheduler level, as well as the network impact of different receiver types and channel quality feedback strategies, provided accurate modeling of those, can also be tested. These simulations focus more on network-related issues such as scheduling mobility handling or interference management .The simulator supplements a link level simulator. This combination allows for detailed simulation of both the physical layer procedures to analyze link-level related issues and system-level simulations where the physical layer is abstracted from link level results and network performance is investigated. The simulator for LTE networks need to be developed for investigating the interference behaviour of femtocells placed within microcells. Thus it is necessary to simulate a multi-cell, multi-user and multi-carrier system in the downlink for Single-Input, Single-Output (SISO) and Multiple-Input, Multiple-Output (MIMO) antenna configurations.

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THE IMPACT OF SOCIO-ECONOMIC-STATUS AND ANXIETY ON DOMESTIC VIOLENCE OF THE RESPONDENTS

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Abstract- The present study was an attempt to investigate the effect of Socio-Economic-Status (SES) on domestic violence of the respondents. An incidental-cum-purposive sampling technique was employed on 100 women selected from Patna city. For this purpose, Manifest Anxiety Scale by Sinha (1968), Domestic Violence Inventory developed by Agrawal and Socio-Economic Status Scale (urban) constructed and standardized by Singh et al. (2000) were used. The obtained data were analysed using t-test. It was concluded that respondents having high SES showed less domestic violence in comparison to respondents having low SES and respondents having high anxiety level showed more domestic violence in comparison to respondents having low anxiety level**.**

Keywords: Domestic Violence, Sampling Techniques, Patna City, T-Test

INTRODUCTION

Domestic violence is a pattern of behaviour which involves violence or other abuse by one person against another in a domestic setting, such as in marriage or cohabitation. Domestic violence can take place in heterosexual and same-sex family relationships and can involve violence against children in the family.

Domestic violence can take a number of forms, including physical, verbal, emotional, economic, sexual and/or psychological (Jain, 1976; Nanda, 1976; Kapur, 1984; Gupta, 2004). Basic formations of family are based on marriage and blood relationship. Family has its own hierarchical structure, where eldest male is usually the head of the family. The relationship in the family culturally defined according to the positions in hierarchical structures, family as an institution in ancient India laid down the principles which regulated the relationship between husband wife and parents and children.

Domestic violence against women is widely recognized public health issue across the globe. Domestic violence covers a range of physical, psychological and sexual coercive acts used against adolescent and adult women by current or former male intimate partner (WHO, 2005). Women's exposure to domestic violence, amidst other factors, could be attributed to their socio-economic positions (Weaver et al., 2009), particularly in patriarchal culture where they are relatively disadvantaged (Barnett, 2000). Socio-economic factors intertwined with patriarchal culture put the women in subordinate position, which in turn have repercussions for three important spaces of women namely; the bodily space, the personal space and the cognitive space (Burlae, 2004). Women's bodily space is violated through physical and sexual violence, while violation of personal space refers to women's experiences of restrained movement in society compared to those of males.

Globally, the victims of domestic violence are overwhelmingly women and women tend to experience more severe forms of violence (Mc Quigg, et al. 2011 & Garcia-Moreno, et al. 2013). In some countries, domestic violence is often seen as justified, particularly in cases of actual or suspected infidelity on the part of the woman and is legally permitted. Research has also shown there to be a direct and significant correlation between a country's level of gender equality and actual rates of domestic violence (Esquivel-Santovena, et al. 2013).

Research shows that victims with disabilities, whatever their age, face specific problems in accessing mainstream services for domestic abuse (Hague, et. al. 2008). This is also consistent with the research showing the reluctance same sex victims have to seeking outside support for dealing with domestic abuse; partly due to a belief they will encounter an unsympathetic response (Donovan and Hester, 2007).

Socio-economic-status is often measured as a combination of education, income and occupation. It is commonly conceptualized as the social standing or class of an individual or group. SES affects overall human functioning: our physical and

mental health, the neighborhoods in which we live, our daily activities and our access to resources. Its effects can be observed across the life span. Variance in SES, such as disparities in the distribution of wealth, income and access to resources, mitigate social problems. Low SES and its correlates, such as lower education, poverty and poor health, ultimately affect our society as a whole.

Anxiety is a feeling of mingled dread and apprehensive about the future without specific cause for the fear. Generally, it refers to an unpleasant emotional state accompanied by physiological arousal and the cognitive elements of apprehensive, guilt and a sense of impending disaster. It is a psychological and physiological state characterized by somatic, emotional, cognitive and behavioral components. It is indicative of absence of adequate measure within organism to meet the threatening and overwhelming situation and interpsychic event. It influence on different aspects of human behaviour. If anxiety is within the limit it serves as a drive, but if its level is increased it causes inhibition and effects adjustment due to insecurity feeling.

OBJECTIVE:

The main objective of the present study was to examine the effect of socio-economic-status and anxiety on domestic violence of the respondents.

HYPOTHESES:

Based on the findings of the previous studies, it were hypothesized that

I. There would be significant difference between respondents having high SES and low SES in respect of domestic violence.
II. The respondents of high anxiety level would have more in domestic violence tendency than the respondents of low anxiety level.

METHODS:

[1] **Sample:**
An incidental-cum-purposive sampling technique was employed on 100 women selected from Patna city. The age of subjects ranged between 25 to 35 years.

[2] Tests used:

The following two tests were administered for the present study

Fig. 1. Socio-Economic Status Scale (Urban) constructed and standardized by Singh et al. (1970) was used to measure the socio-economic status of the respondents.

Fig. 2. Taylor's Manifest Anxiety Scale (TMAS) Hindi adaptation by Sinha (1968) was used to measure anxiety level of offenders.

Fig. 3. Domestic Violence (Lethality) Inventory (DVI) developed by Agrawal was used to measure domestic violence of the respondents.

[3] Procedure of data collection:

The researcher established full rapport with the respondents prior to test administration. After rapport establishment, TMAS, DVI and SES scale were administered. The data were analyzed by using "t-test".

RESULTS AND DISCUSSION:

The obtained results are presented in table given below.

Table-1

Compare between respondents having high and low SES in respect of domestic violence.

Groups	N	Mean of percentile scored	SD	t-value	Df	p-value
High SES	22	41.83	9.38	4.75	53	<.01
Low SES	33	49.52	8.29			

It is obvious from the results presented in table-1 that mean of percentile scored by respondents having high SES is 41.83 on the domestic violence inventory, another hand mean of percentile is 49.52 of those respondents whom belong to low SES on the measure of domestic violence. The mean difference is significant as the t-ratio is (t=4.75) significant beyond .01 level of significance. Thus, the hypothesis is confirmed through the results by showing respondents, having high and low SES differed significantly in respect of domestic violence. This finding is in agreement with that of Kumud Sharma of the centre for Women's Development studies in New Delhi traced the correlation between education and domestic violence to patriarchal attitudes. She found that educated women are aware of their right.

Table-2

Comparison on anxiety level in respect of domestic violence.

Groups	N	Mean of percentile scored	SD	t-value	Df	p-value
High Anxiety Level	60	44.63	5.74	2.26	98	<.05
Low Anxiety Level	40	41.24	8.21			

It is obvious from the table-2 that the mean of percentile scored respondents having high anxiety level is 44.63 and low anxiety level is 41.24 on the measures of domestic violence. The mean difference is significant as the t-ratio is (t=2.26) significant beyond .05 level of significance. Thus, the hypothesis is confirmed through the results by showing respondents, having high and low anxiety level differed significantly in respect of domestic violence.

CONCLUSION:

It is concluded that

[1] There is significant difference between respondents having high and low SES in respect of domestic violence. The respondents having high SES showed less domestic violence in comparison to respondents having low SES.

[2] The respondents of high anxiety level showed more domestic violence in comparison their counterparts. Several study show that high anxiety level tends to frustration and insecurity. So, respondents having high anxiety level show more domestic violence.

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