**Mathematical modelling, simulations and computations in some interesting problems in physics and mathematics**

**CERTIFICATE**



This is to certify that the project work title “Mathematical modelling” has been successfully carried out by Gursimran Singh, a student of B.E Computer science and Engineering, Thapar university, Patiala, under the “KVPY Summer Camp 2011” from June 1 to July 13 2011, under the guidance of Prof. K G Suresh, Physics Department, IIT Bombay.

Prof. K G Suresh

Physics Department

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Mathematical modelling

Definition

Need

Dynamical systems

Deterministic

Non chaotic deterministic dynamical system

Numerical analysis

Newton raphson

Secant

Regula falsi method

Euler

Newton quadrature

etc

ODEs models

Physics

Ball projectile

Particle in magnetic field

Particle in electric field

Magnetic field of a line

Mathematics

Taylor coefficients

PDEs

Chaotic deterministic dynamical system

Lorentz attractor

Complex dynamics

Fractels

Iterated functions

Manderbrot set

Julia set

Chaos

Random number generator

Newton fractels

Sapinski triangle

Stochastic

Simulations

Example

Random walks

Inferential statistics

Monti carlo simulations

STATIC system

Asdasd

Sada

Physics

Condensed matter physics

Magneto caloric effect and adiabetic demagnetisation

Explanation

What to do in this

Data – using magnetometer

Data analysis

Plotting in matlab

Curve fitting…

**Abstract**

**Get examples from IYER**

What do I learnt out of it.

Computational science – to keep the subject in line with computer science and

While doing in as natural science as physics..

Why physics

Thanks to KG Suresh, Bibekanandani Maji