Indian Institute of Technology Mandi
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भारतीय प्रौद्योगिकी संस्थान मण्डी
कमान्द-175005, हिमाचल प्रदेश, भारत

RECRUITMENT OF JUNIOR RESEARCH FELLOW FOR THE SERB PROJECT

Applications are invited form the citizen of India for the following temporary position for the sponsored project from the Science and Engineering Research Board (SERB) in the School of Engineering, IIT Mandi. Based on successfully full filling the criteria, the offer would be for one year initially. The offer can be extended through the project duration, based on performance. If candidate also fulfills the institute criteria, admission in Ph.D. can be considered.

The requisite qualification, experience and other details are given below:

Project Title	Development of Adaptive Unstructured Angular Discretisation Grid for the Finite Volume Method of Radiative Transfer Equation for Collimated Beam Radiation.
Funding Agency	Science and Engineering Research Board (SERB)
Position and Salary	Junior Research Fellow (1 Post) Consolidated Salary Rs 25000/- per month
Essential Qualification	Masters or equivalent degree in Engineering.
Desirable Qualifications	The candidate should be good in C++ programming, data structures and have worked on some general purpose C++ code. The knowledge of debugger is essential to work on general purpose code. It would be added benefits if the candidate has worked in computational fluid dynamic (CFD) Meshing and OpenFOAM.
Job Profile	The candidate should understand quickly the OpenFOAM file system and syntax. The OpenFOAM code is in C++ and modify the code as per project requirement.

Interested candidates can send their short CV (no more than 2 pages; Please include most relevant information suitable to project) via email to pradeepkumar@iitmandi.ac.in **before 15th October, 2016**. Please write "**Application for JRF**" in the subject lines of the email. The shortlisted candidates would be intimated by email for their mode of interview and date. The tentative date for interview is **28th October, 2016**.

Description of the Project:

It is a general myth that the radiation heat transfer is only important at very high-temperature applications; however, this is not true. In general, the radiation plays equally important role in the natural convection problems. The radiation heat transfer problems are treated in two ways (1) Surface to Surface radiation (2) Radiation in participating medium. The former way of analysis is relatively simple whereas later one is complex in all aspects, i.e., mathematically, numerically, physics, etc. The radiation problem can also be categories as diffuse and collimated beam radiation. The radiation problem from elevated temperature can be treated as diffuse radiation problem, whereas radiation energy travelling in a particular direction belongs to collimated beam radiation category. The radiation problems from optics to biomedical field belong to collimated beam problem. The solar radiation is also an example of collimated beam radiation.

The radiation heat transfer can be modeled by an integrodifferential equation known as Radiative Transfer Equation (RTE). This equation represents radiation energy conservation in a direction. To achieve an accurate solution, one need to solve RTE numerically in many directions but need to limit the number of directions by keeping the computational resource in mind. Many numerical techniques have been developed to solve the RTE. The most popular technique is finite volume method for RTE (FvRTE). Along with the CFD domain discretization, FvRTE also discretized the angular domain of 4Pi. The angular domain discretization is regular using the spherical coordinate system with unit radius. This kind of angular discretization produces acceptable results for the diffuse radiation; however, it gives unacceptable results for the collimated beam radiation problems. So FvRTE can not be used for the collimated beam problem in the present form. It is required to improve the angular discretization technique for the collimated beam problems. This project deals to improve the angular discretization so that FvRTE can be used with collimated beam radiation problems.