Thesis Project Offer

Joint Research and Education Programme "Palestinian-German Science Bridge PGSB"
Forschungszentrum Jülich GmbH & Palestine Academy for Science and Technology

Thesis type*

☐ BSc	☒ MSc	☐ PhD	Intended starting date (approx.): 1.11.2020

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Project description*

For the first wall of a future fusion reactor, tungsten (W) is the main candidate material for the plasma facing material of a fusion reactor. However, the intrinsic brittleness of tungsten is a concern under high transient heat loads and mechanical stress. To overcome the brittleness of W, tungsten fiber-reinforced tungsten (W_f/W) composites have been developed relying on an extrinsic toughening principle.
In recent studies, based on a Field Assisted Sintering Technology (FAST) process, a powder metallurgical (PM) route to produce W_f/W has been established. For PM produced W_f/W, short/discontinues tungsten fibers are used. For discontinues fiber-reinforced composites, fiber length is one of the crucial factors to realize the desired pseudo ductile behavior. At current stage of W_f/W development, the study of the effect of fiber length on W_fW properties is still a gap. The optimization of the fiber length is urgently required. In this master thesis, W_f/W with different fiber lengths will be prepared by FAST process. Microstructural and mechanical characterization will be performed to find the optimal fiber length.
This study provides technical basis and theoretical basis for designing and preparing fiber-reinforeced composites with high strength, high toughness and high temperature resistance.

Date*	Signature*

* required field

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