0809-T03

Proposals for Fellowships
TRAINEE

Title	***Modelisation of the heat flow in the polaris-vessel***
Description	The POLARIS set-up will enable performing the following measurements on irradiated sample (fuel + cladding) by simulating the in-pile conditions of high temperature at the center of the fuel (about 1000 K, obtained by laser heating) and 500 K at the periphery (obtained by forced cooling): • Steady state heating: determination of the temperature profile, analysis of the gas release • Steady state heating + laser flash: determination of the thermal diffusivity, thermal conductivity and fuel-cladding contact conductance • Power transients + accidents: determination of the temperature profile, analysis of the gas release, thermal diffusivity for slow transients, effect of depressurization In order to assure the operations conditions (water temperature ≈ 460 K and radial temperature of the sample ≈ 500 K), we have to foreseen a cooling set-up with pressurized water. A traineeship is proposed, aiming to model the heat flow in the vessel, including the sample and the cooling system. The solution can be obtained by finite element approach. In a first step, the model has to consider only the steady state regime. In a second state, the model can be improved with solution of transients. The trainee will have the opportunity to validate the model by making some experiments on our mock-up. This model will allow us to determine the characteristics of the cooling system we need and if it is possible to regulate the periphery temperature at 500 K.
Type of traineeship	See drop-down menu
Duration of traineeship	**6 months**
Required skills or qualifications	Knowledge in heat transfer and finite elements modeling
Unit	E.03 Material Research
Action	51301 FAR
Supervisor	L. Vlahovic
Remarks:	
Reference	will be completed by MSU-HR