

Séminaire du laboratoire PIMM

Jeudi 17 juin 2021 à 13h30 sur Teams

Dr. Filip SSKA

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présentera dans le cadre du séminaire ses travaux intitulés :

Numerical analysis of twin thickening in HCP metals

The HCP metals and alloys like Mg or Ti are appealing construction materials due to their low density which is useful in lightweight application. However, the HCP lattice is well-known for the limited amount of easily activated slip systems, which results in twinning being the significant deformation mechanism in these materials. However, twinning has a significant impact on formability due to its unidirectionality and activity only in certain orientations. Twinning is also a relatively complex process that consists of three distinct phases: nucleation, propagation and thickening. The nucleation takes place on an atomistic level and it has stochastic nature. The propagation is the fast twin lamella growth across the grain. The thickening process is twin growth in a perpendicular direction which depends on applied stress and twin-microstructure interactions. The presentation will show the analysis of the twin thickening process and twin interaction with microstructural features in Mg alloys. The analysis is based on the finite element method combined with crystal plasticity, which is an effective tool for the description of stress/strain fields inside and around the twin.