

第136回

附属社会創造数学センター主催

北大MMCセミナー

Date : 2023年5月8日(月) 16:30~18:00

Speaker : 木村 正人 (金沢大学 教授)
KIMURA, Masato (Kanazawa University)

Place : 北海道大学 電子科学研究所
中央キャンパス総合研究棟2号館5階 講義室

Title : 多孔質媒体における流体駆動破壊の
フェーズ・フィールド・モデル: 水圧破碎と乾燥破壊

**Phase field model of fluid-driven fracture in a porous medium:
hydraulic fracturing and desiccation cracking**

Abstract:

Fluid-driven crack propagation is an important issue related to the fracking well stimulation technique in these decades. There are two major issues related to fluid-driven crack propagation, namely: hydraulic fracturing and desiccation cracking. Hydraulic fracturing occurs due to the high water injection in a reservoir which causes open cracks along the fluid flow. Opposite to hydraulic fracturing, desiccation cracking is reproduced by water evaporation along the material surface which can induce volume shrinkage in the material. We propose a phase field model for crack propagation due to fluid pressure which is applicable to both hydraulic fracturing and desiccation cracking. The proposed model involves irreversibility of the crack propagation, non-penetration condition of the crack surface, fluid pressure in the porous medium, and a natural energy dissipation property.

This is a joint work with Sayahdin Alfat, Kanazawa University.

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※換気のため一部窓を開けて開催します。体温調節可能な服装でお越しください。