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COMPUTATIONAL FRACTURE MECHANICS FOR MULTI-PHYSICS COUPLED PROBLEMS

(100 - FRACTURE, DAMAGE AND FAILURE MECHANICS)

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ABSTRACT

The multi-physics coupled problem has become a popular research field and attracted increasing attentions of researchers from various areas. With the rapid development of computer aided simulation technology, the numerical simulation is becoming a practical and effective means to study multi-physics coupled problems. Among these problems, fracture propagation under multi-physics coupling scenario has become a focus because of the involvement of the complex cracking topology and its intricate underlying mechanisms.

Hence, this mini-symposium is to bring together researchers in various fields to discuss and exchange ideas and visions about computational models and methods, such as XFEM and the phase-field method, on fracture simulations coupled with multiple physics.

The topics of interest for this mini-symposium include, but are not limited to,

a) Fracture mechanism and simulation on fluid-solid interaction, such as hydraulic fracturing and drying process;

b) Research on fracture under thermal-mechanical coupling scenario, such as fracture propagation under thermal shock;

c) Computational fracture model coupled to chemical environment, such as lithium battery electrode fracture in the case of charge and discharge as well as fracture induced by erosion;

d) Multi-physics coupled fracture in multilayered porous media, such as biological tissues, articular cartilage, ceramics, thermal barrier coating and so on. The physical fields considered include chemical, thermal, electric and mechanical.

e) Newly developed computational methods for fracture simulation.