

Speaker : Takashi Okayasu (Kyushu University)

**Title : Cyclic Elastoplastic Constitutive Model for Granular Materials
Considering Particle Structure**

Various constitutive models for materials have been developed in the last century. Among them unconventional plasticity is a key theoretical framework for describing cyclic loading behavior of materials. The "subloading surface model" proposed by Hashiguchi (1980) belonging to that framework does not assume a purely-elastic domain inside a yield surface and premises that an inelastic deformation is induced by a stress change inside the yield surface. This model has already been introduced into several finite element analysis (FEA) codes including commercial software and then these codes have been utilized for solving cyclic deformation phenomena in engineering fields such as fatigue and compaction of materials.

On the other hand, in granular materials such as sand and gravel, the plastic deformation is rapidly suppressed with developing the internal packing between particles. The model is extended so as to describe this behavior. In this seminar, the fundamental concept and features of the extended model for granular materials are outlined briefly. Typical deformation phenomena observed in structure of granular material subjected to repeated loads are computed by FEA code incorporating the model and the validity is also verified by comparisons with test data.