

The smoothed particle hydrodynamics method for elastic-plastic structures

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Particle methods of fluid dynamics have some advantages for safe analyses to defend from natural disasters that are tsunami etc. Particle methods are used for fluid dynamics which are complicated fluid structural interaction problems. In fluid structural interaction analyses, if the structures are subjected to the large deformation, the stress may exceed the yield stress in the structures. In these cases, the elastic-plastic phenomena should be considered to the structural analysis. The smoothed particle hydrodynamics (SPH) method is usually calculated by explicit procedure. The elastic-plastic treatment during deformation for the explicit calculation procedure, that is suitable to the SPH method, is applied to the SPH in the present paper. The elastic-plastic calculation of the SPH method is performed for uniaxial tensile test and the dynamic press process.

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