

## Combined Method of Rigid Bodies Spring Model and Discrete Element Method

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The rigid bodies spring model (RBSM) has been developed as a numerical model generalizing limit analysis in plasticity, in which a structure to be analyzed is idealized as assemblage of rigid bodies connected by normal and tangential springs. Although handling of a contact surface has a difference between RBSM and the distinct element method (DEM), the degree of freedom is the same. If formulization by the explicit method for each element is used, the algorithm of a dynamic analysis is completely the same. In this paper, we illustrate formulization of RBSM for each element using the principle of hybrid virtual work. The same discussion is expanded also about DEM, and the combined method of RBSM and DEM is expressed. Moreover, we examine the accuracy of the solution obtained from some examples of numerical computation by present method.

**Keywords:** RBSM, DEM, Combined model, explicit method