# SEISMIC COLLAPSE TESTS AND SIMULATIONS OF REINFORCED CONCRETE FRAMES WITH NON CONFINED BEAM-COLUMN JOINTS

**Fan Wang[1], Thierry Chaudat[1], Sylvain Lavarenne[2], Gilbert Guilhem[2]**

*[1] CEA, DEN, DM2S, SEMT, EMSI, Saclay, F - 91191 Gif-sur-Yvette, France.*
*fan.wang@cea.fr, thierry.chaudat@cea.fr*
*[2] IRSN, DSR, SAMS, BAGCS, B.P. 17, 92262 Fontenay-aux-Roses Cedex, France*
*Sylvain.lavarenne@irsn.fr, gilbert.guilhem@irsn.fr*

**ABSTRACT :**

This paper presents static and shaking table collapse tests as well as numerical simulations conducted on a series of 5 one-bay and one-storey RC frames with different beam-column joint detailings. While the collapse of the well detailed reference specimen was due to column reinforcing bar failures after yielding, the collapses of the other 4 specimens which have no transverse beam-column joint reinforcement were caused by the failure of the joints at considerably reduced load levels. Numerical simulations have been performed using CAST3M code developed by CEA. The frame is represented by beam fibre models and a non linear shear law with softening is assigned to the joint element to model its shear failure. It is shown that despite its simplicity, the finite element model used can reproduce realistic behaviour of the tested RC frames up to failure.

**KEYWORDS:** Existing buildings, beam-column joint, seismic test, collapse simulation