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Improvement of the Tin description: influence of the equation of state on phase change kinetics and damage modeling. GREGORY ROBERT, CEA DAM DIF, LAURIANNE PILLON, CEA, DAM, DIF, F-91297 Arpajon, France, CAMILLE CHAUVIN, CEA, DAM, CEG, F-46500 Gramat, France — When a solid material is undergoes to dynamic loading (HE, plate impacts ...), a shock wave propagates from the impacted surface and reflects on a free surface. The behavior of this free surface depends on the local state of matter and its roughness: spall will appear in a solid material and the free surface remains undamaged, microspall will crumble in a particles cloud the free surface of a liquid or mixed solid/liquid material and microjetting will appear in addition on a rough surface. The description of these processes in hydrodynamic codes remains a challenge. Both the equation of state, phase change kinetics, elastoplasticity and damage modelling are involved in this full description. In order to improve our understanding of these mechanisms, we have initiated a working program on tin: it is based on atomistic calculations, experimental observations (plate impacts experiments involving fast XRD and PdV measurements) and comparisons with the description obtained by hydrocodes. In this presentation, we will focus on the consequences of the equation of state on phase change kinetics and micro-spalling description.

Gregory Robert
CEA DAM DIF

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