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Coupling phase transition kinetics and hydrodynamics: Models for solid-solid and liquid-solid transformation in dynamically driven materials[1] JONATHAN BELOF, LORIN BENEDICT, ALEXANDER CHERNOV, BURL HALL, SEBASTIEN HAMEL, TOMORR HAXHIMALI, BABAK SADIGH, LUIS ZEPEDA-RUIZ, Lawrence Livermore National Laboratory — High pressure and high strain-rate experiments are opening a new frontier toward the study of material science under extreme conditions. As the energy density of experimental platforms is increased, the timescale for observation is typically decreased to the point where the time dependence of phase transitions is now a subject of direct study. We will present new phase transition kinetics models that have been developed with unique considerations that arise in shock-wave driven phase transformation, highlighting applications of the methodology to the simulation of recent experiments of iron and water.

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