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Continuum modeling of porous compaction in asteroid materials[1]
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— Models of the response of porous materials to dynamic loading are important for simulations of asteroid impact and deflection scenarios. In hydrocode calculations, porosity is commonly treated by modifying the scalar equation of state (EOS), such as by describing the pressure during compression from the initial, porous state to solid density with an empirically-derived compaction curve. This approach is simple but not rigorous or predictive in general, for different initial porosities, because the compaction process is dominated by shear strain as pores are closed. Detailed compaction processes can be investigated using resolved-microstructure simulations, but the response can be represented at the continuum level by modifying the strength model to include the variation of shear modulus and flow stress with porosity as well as the compression and temperature of the solid.

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