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Early emission from supernova explosions through dense porous shells[1] SHANE COFFING, University of Michigan, Los Alamos National Laboratory, CHRIS FRYER, SUZANNAH WOODS, Los Alamos National Laboratory , CAROLYN KURANZ, University of Michigan — During supernova shock breakout, radiation from the supernova shock pours out into the surrounding circumstellar medium. The resulting emission and its interaction with this media can be used to probe stellar and explosion characteristics. Many calculations assume a smooth transition between the outer atmosphere of the star and its wind, however, radiatively-driven instabilities, mass eruptions, convective instabilities, and other mechanisms can produce large-scale inhomogeneous structures such as dense shells and clumps in the wind. The interaction of the breakout emission with these structures can lead to widely varying spectral signatures, particularly in UV and X-ray, unique to the density, composition, state, and distributions of these inhomogeneities. In this work, we present results of 2D multi-group radiation hydrodynamic simulations of supernova shock breakout through inhomogeneous winds, focusing on interaction with dense porous shells that are clumpy, irregular, and optically porous.

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