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Thermal and Nonthermal Radiation in SNRs from Efficient Shock Acceleration[1] DON ELLISON, North Carolina State Univ., DANIEL PATNAUDE, PATRICK SLANE, Harvard Smithsonian Center for Astrophysics — Efficient cosmic ray acceleration in supernova remnants results in both higher shock compression and lower post shock temperatures compared to cases where cosmic ray production is ignored. These changes in the properties of the shocked plasma will translate into changes in the thermal X-ray emission in the interaction region between the forward and reverse shocks. Furthermore, the relativistic cosmic ray electrons produced in the diffusive shock acceleration process generate nonthermal X-ray synchrotron emission which is self-consistently determined with the thermal emission through the nonlinear shock acceleration mechanism. We present results from simulations where the remnant hydrodynamics are coupled to efficient cosmic ray acceleration and to a nonequilibrium ionization calculation of thermal X-ray emission. By varying the particle injection efficiency, ambient density, and the electron heating mechanism, we produce a grid of models which show variations in the resultant X-ray spectra where the thermal and nonthermal contributions are determined self-consistently.

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