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Production of Magnetic Turbulence by Cosmic Rays Drifting Upstream of Supernova Remnant Shocks MARTIN POHL, Iowa State University, JACEK NIEMIEC, Polish Academy of Sciences, TOM STROMAN, Iowa State University — We present results of 3-D Particle-In-Cell simulations of magnetic turbulence production by cosmic-rays drifting upstream of supernova remnant shocks. The studies aim at testing the predictions of a strong amplification of short-wavelength nonresonant wave modes and at studying the subsequent evolution of the magnetic turbulence and its backreaction on cosmic ray trajectories. We confirm the generation of the turbulent magnetic field due to the drift of cosmic-ray ions in the upstream plasma, but show that an oblique filamentary mode grows more rapidly than the nonresonant parallel modes found in analytical theory. The growth rate of the field perturbations is slower than estimated for nonresonant modes using the quasilinear approach, and the amplitude of the turbulence saturates at about $\delta B/B \sim 1$.

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