

Abstract Submitted
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Magnetically limited X-ray filaments in young SNR MARTIN

POHL, Iowa State University — We discuss the damping of strong magnetic turbulence downstream of the forward shock of young supernova remnants (SNR). We find that strong magnetic fields, that have been produced by the streaming instability in the upstream region of the shock, or by other kinetic instabilities at the shock, may be efficiently damped, so the region of enhanced magnetic field strength would typically have a thickness of the order $l_d = (10^{16} - 10^{17})$ cm. The non-thermal X-ray filaments observed in young SNR are thus possibly limited by the magnetic field and not by the energy losses of the radiating electrons, so the thickness of the filaments would not be a measure of the magnetic field strength and claims of efficient cosmic-ray acceleration on account of a run-away streaming instability would appear premature. We emphasize the importance of radio polarimetry studies in determining the properties of strong magnetic turbulence near the forward shocks of SNR.

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