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Nonthermal Filaments in CAS A: Testing Plasma Turbulence MAXIM LYUTIKOV, Purdue University — Young supernova remnants are prime candidates for CR acceleration up to the "knee" energies. In addition, they often show thin non-thermal X-ray filaments associated with the forward shock. We use 1 Msec Chandra observation of Cassiopeia A to study the spectral evolution across the X-ray filaments and to determine the properties of the plasma turbulence. Using advection-diffusion modeling of synchrotron emission, we find magnetic field, diffusion strength and the plasma turbulence level in the shocked plasma. This provides an important observational test of the CR acceleration models.

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