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The growth of magnetic turbulence and transport of cosmic rays in supernova remnant precursors. BRIAN REVILLE, Max-Planck Institut fuer Kernphysik, JOHN KIRK, Max Planck Institut fuer Kernphysik, STEPHEN O'SULLIVAN, Dublin City University, PETER DUFFY, UCD Dublin — The process of first order Fermi acceleration in supernova remnant shocks has long been the favoured mechanism for producing cosmic rays in our galaxy. One of the major difficulties with this picture however is that it must be pushed to its limits to even approach the so-called knee of the cosmic-ray spectrum, below which most particles are believed to be galactic in origin. The two greatest uncertainties in determining the maximum achievable energy in this picture are the magnetic field and the transport properties of the relativistic particles, although these are not independent of one another. Amplification of the magnetic field beyond the linear regime, via the non-resonant current driven instability is investigated as a possible method to resolve this problem. We report on recent numerical calculations of magnetic field growth and the transport properties of relativistic particles in the resulting amplified field. We speculate on the importance of these results in the context of particle acceleration.

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