

## GeV emission from protostellar jets

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Synchrotron radio emission from non-relativistic jets powered by massive protostars has been reported, indicating the presence of relativistic electrons and mG magnetic fields. We study diffusive shock acceleration and magnetic field amplification in protostellar jets with speeds between 300 and 1000 km/s. We show that the magnetic field in the synchrotron emitter can be amplified by the non-resonant hybrid (Bell) instability excited by the cosmic-ray streaming. By combining the synchrotron data with basic theory of Bell instability we estimate the magnetic field in the synchrotron emitter and the maximum energy of protons. Protons can achieve maximum energies of about 0.1 TeV and emit GeV gamma rays in their interaction with matter fields. We predict that Fermi can detect gamma rays in IRAS 16547-5247 and IRAS 16848-4603. The detection of this radiation by the Fermi satellite in the GeV domain may open a new window to study the formation of massive stars, as well as diffusive acceleration and magnetic field amplification in shocks with velocities of about 1000 km/s.

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