

COSMOLOGICAL MAGNETIC FIELDS AND PARTICLE ACCEL- ERATION IN THE LABORATORY

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Turbulence and magnetic fields are ubiquitous in the Universe. Magnetic fields are also essential for the production of high energy cosmic rays. While there is no general consensus, the standard theoretical model for the origin of these fields is through the amplification of tiny seed fields via turbulent dynamo. Here we show, via laboratory experiments using high power lasers, that magnetic fields can be amplified via the dynamo process in a magnetized plasma. We also show that wave-plasma turbulence heats electrons above the thermal pool and thus initiates particle acceleration.

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