

Abstract Submitted
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A new laboratory stellarator for basic plasma research and wave studies THIERY PIERRE, CNRS unite 7345, LPIIM, Marseille — A new laboratory stellarator was built for basic plasma. The device is designed following the early concept of the Spitzer’s B1 to B3 stellarators built in the early 50’s. The goal is to study anomalous transport and turbulence in this device, and to study wave chaos at low frequency in this complex closed magnetized plasma. In stellarators, it is well known that a special design of the torsion and of the local curvature of the magnetic field lines is necessary to obtain a stable plasma. In the B3 machine, the torsion of the magnetic field line was not continuously varying in plasma. The second point is the necessity to build a magnetic surface. The new magnetized plasma machine is a table-top machine ($r = 6$ cm) shaped in a “Figure Eight” design including the possibility to vary the twisting of the magnetic field lines. In this way, it is possible to start from a toroidal type configuration without rotational transform (unstable) and to change for a magnetized “Figure 8” plasma that produces a stable plasma. The plasma is created by thermionic emission of ionizing electrons emitted from a hot tungsten filament or by microwave excitation at a frequency close to the electron cyclotron frequency. When the radial electric field is minimum, the propagation of ion acoustic waves is studied in the direction parallel to the magnetic field. Wave chaos related to the internal feedback present in this topology is investigated.

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