Abstract

The Levitated Dipole Concept (LDT) is an innovative device for the production of high quality plasma. A levitated poloidal coil is used to confine a low density plasma in a variable length tubular torus. The device is designed to support superconducting poloidal and toroidal fields. The device is intended to be used as a source of high quality plasma for fusion research.

Significant Stored Energy in Thermal Plasma

The level of stored energy in the plasma is a critical parameter for the performance of the device. The energy stored in the plasma is given by the formula:

\[ E = \frac{1}{2} n \rho c^2 \]

where \( E \) is the energy stored in the plasma, \( n \) is the density of the plasma, \( \rho \) is the mass density of the plasma, and \( c \) is the speed of light.

Towards Higher Density Dipole Confined Plasmas

The device is designed to support superconducting poloidal and toroidal fields. The device is intended to be used as a source of high quality plasma for fusion research.

1 MW ICRF Transmitter (3-28 MHz)

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University of Maryland 28 GHz Gyrotron

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Levitated Dipole Experiment (LDT) Experiment

The Levitated Dipole Experiment (LDT) is a novel device for the production of high quality plasma. The device is designed to support superconducting poloidal and toroidal fields. The device is intended to be used as a source of high quality plasma for fusion research.

Figure 4

Inward Particle Pinch Observed during Levitated Plasmas

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Effect of Plasma in the Levitated System

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Levitated Dipole System

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Low Frequency Fluctuations consistent with Turbulent Pinch

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Levitated Dipole Power Balance Scaling

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