



PHYSICS COLLOQUIUM

Magnetic Self-Organization in the Reversed Field Pinch Plasma



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Abstract: Magnetic self-organization in a plasma refers to processes where, for example, gradients in the plasma current and pressure lead to magnetic instabilities, which in turn feedback on the structure of the plasma and its free energy sources. The reversed field pinch (RFP) magnetically confined plasma exhibits a number of self-organizing effects that resemble those observed or believed important in astrophysical plasmas, thus providing an excellent laboratory to help understand the self-organizing processes. The RFP is also a candidate approach to plasma confinement for thermonuclear fusion. In the fusion context, magnetic self-organization is both a challenge and opportunity for achieving a sustained hot plasma. Research from the Madison Symmetric Torus here in the UW physics department will be described to illustrate self-organization physics in the RFP.