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Overview of RFX-mod Results PIERO MARTIN, MARIA ESTER PUIATTI, Consorzio RFX - Associazione EURATOM-ENEA sulla fusione, Padova, Italy, THE RFX-MOD TEAM — RFX-mod (R=2m, a=0.457m) is proceeding in its mission to explore RFP confinement in the plasma current range >1MA, to extend the knowledge base on MHD stability active control and to contribute to fusion science, in particular in the low-magnetic field regime. The main recent results is the discovery, at high plasma current (I>1 MA), of plasma self-organization in a 3d single helical axis equilibrium, with m=1,n=7 helicity [Nature Phys 2009]. The helical state has almost conserved magnetic flux surfaces, with strong core electron transport barriers. Electron temperature Te reaches 1.3keV @1.7MA. Ti is ∼(0.5-0.7)Te, consistent with collisional ion heating. Magnetic surfaces quality improves with current. Together with a global overview of the recent results, advances on active feedback control of tearing modes and RWM will be presented (RFX has a system of 192 independent feedback coils), as well as, in particular, the progress in understanding density limit and plasma edge physics. At the plasma edge temperature barriers are also observed and current density fluctuations are measured and interpreted as Drift-Alfven vortices, similarly to what happens in Earth magnetosphere. First wall lithization is under development. The flexibility of the device allows for low-current tokamak operation, for both edge turbulence and active MHD stability control studies.

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