

Rapidly-Rotating Turbulence and Spontaneous Magnetic Field Generation

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We discuss the underlying structure of rapidly-rotating turbulence at low Rossby number. It has been known for over half a century that the large scales in such turbulence are dominated by long-lived cyclonic vortices, yet there is still no agreement as to exactly how these columnar vortices are formed or maintained. We discuss one possible mechanism, with particular emphasis on the role of inertial waves in maintaining columnar structures. This leads naturally to the idea that, if the magnetic Reynolds number exceeds some threshold, spontaneous magnetic field generation is inevitable in rapidly-rotating turbulence.