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Removal of magnetic flux from self-gravitating clouds due turbulent reconnection

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Understanding the star formation is a central problem of modern astrophysics. The interstellar medium, where stars are formed, is known to be magnetized and turbulent. The concentration of magnetic flux inside clouds of gas in the interstellar medium is an obstacle for the gravitational collapse of such clouds, that ultimately will give rise to stars. Ambipolar diffusion is considered, by some authors, the most relevant mechanism to transport magnetic field out of these clouds, allowing the collapse to proceed. We are going to present a numerical study about self-gravitating clouds in the presence of magnetic field and turbulence, aiming to test the efficiency of removal of magnetic flux from the interior of these clouds due the turbulent reconnection process, instead of ambipolar diffusion. It allows one to compare the relative importance between the ambipolar diffusion and the turbulent transport of magnetic field in some scenarios of star formation.