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Dynamical analysis of transient induced vorticity in
protoplanetary discs.

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Planet formation is not an isolated phenomenon but is closely related to the star-forming environment through perturbations and material exchange. There is also significant evidence for the Solar System having formed in a dense star-forming environment like the Orion Nebula Cluster. Furthermore, vortices inside protoplanetary discs may play an important role for planet formation [1,2,3]. Here we present the recent results of our research project on the effects of the perturbations by the environment of the Sun's birth cluster on the proto-Solar-system. We find that the perturbations induce transient vortices in circumstellar discs, and we address their possible role in the young Solar system. Focus will be on the lifetime and the orbital properties of vortices and implications for the trans-Neptunian objects as well as on the possible presence of a planet at 80 AU around TW Hya[4]. In addition, some new aspects of the Lithium depletion issue and its possible connection with planet formation will be discussed.

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