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Evolution of the outer planets and planetesimals due to gas drag in transition disks SAMUEL NAVARRO, MAURICIO REYES-RUIZ, HÉCTOR AVEVES, Universidad Ncl. Autonoma de Mexico (UNAM), CARLOS CHAVEZ, Universidad Autonoma de Nuevo Leon (UANL), SANTIAGO TORRES, Universidad Ncl. Autonoma de Mexico (UNAM) — We study the effect of aerodynamic drag due to the gaseous component of a transition protoplanetary disk, on the process of giant planet migration due to the interaction with a disk of planetesimals. We present a series of numerical simulations of the dynamics of the four outer planets in our Solar System and a disk of planetesimals exterior to these; planets are arranged in a compact, multiresonant configuration as that proposed in the so-called Nice model. We model the gaseous component of the protoplanetary disk as both a minimum mass solar nebula and a viscous accretion disk model, both truncated out to a disc radius of approximately 20 AU, following recent observations. We find that aerodynamic drag has important consequences on the early evolution of the compact Solar System. As pointed out previously by other authors, gas drag leads to planetesimal trapping in low order resonances, particularly for kilometer size bodies. In our case, since planetesimals are all located initially outwards of Neptune, these are trapped in outer resonances with such planet on typical timescales of a few million years. This effect leads to an accelerated migration scenario, with the system becoming dynamically unstable on a very short timescale, in comparison to gas free scenarios.

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