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External Photoevaporation of the Solar Nebula II: Effects on Disk Structure and Evolution with Non-Uniform Turbulent Viscosity due to the Magnetorotat

External photoevaporation by FUV radiation from nearby massive stars can cause mass loss at the outer edge from $\sim$ 50\% of all disks around low mass stars (Lada \& Lada 2003). Some disk evolution models consider the effects of external photoevaporation (Mitchell \& Stewart 2010; Anderson et al.\ 2013) on disk evolution with the standard α-viscosity parameterization,\ i.e., a spatially and temporally uniform turbulent viscosity coefficient α.\ This useful simplification parameterizes viscosity instead of attributing it to a realistic physical mechanism. Our work describes numerical simulations of disk evolution that not only include the effects of external photoevaporation, but also a viscosity treatment derived directly from magneto-rotational instabilities using the formulations of Bai \& Stone (2011), which relate α to the local ionization state in the disk.\ Exploring the parameter space of some important factors related to dust properties and ionization sources, we calculate the ionization state in the disk, and find a radially varying efficiency of angular momentum transport with $\langle\alpha\rangle$ $\leq$ 10^{-5} in the inner disk ($<$ 2 AU) rising to 0.1 beyond 20 AU. This drastically alters mass flow and structure of the disk. Slow inner disk evolution is contrasted by rapid evolution in the outer disk, leading to steep Σ profiles ($\Sigma \propto r^{-\langle p\rangle}$ with $\langle p\rangle \approx 2 - 5$ in the 5-30 AU region), which are made steeper by photoevaporation. We find that dust efficiently absorbs charges in the inner disk, further lowering α, stalling inner disk evolution. We also find that external photoevaporation in a non-uniform α-disk is able to draw mass from the inner disk (as close as 3 AU) towards the outer edge. These effects may have dramatic implications for planet formation and volatile transport in disks.