Modification of angular velocity distribution by inhomogeneous growth of MRI in accretion disks

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We have performed two-dimensional CIP -MOCCT simulations of Magneto Rotational Instability (MRI) in accretion disks. Gases around the massive objects such as black holes, neutron stars and protostars accrete to the central star so that the accretion disks are formed. When the accretion disks have a weak magnetic field, it is well known that the MRI is excited in the disks. Linear analyses by Fleming, Stone & Hawley(1999) show that MRI growth rates are affected by various factors. In this study, we are particularly interested in the effects of radial inhomogeneity of the MRI growth rate. We focus on the two issues, (case-1) growth rate inhomogeneity due to spatial variation in the magnetic configuration, and (case-2) growth rate inhomegeneity due to spatial variation in electrical resistivity. In both cases, we observe inhomegeneous MRI growth to modify the radial profile of the angular velocity significantly. Implication of these results to the planetary system formation process is discussed.