Mass transport Rate of Gas Discs around Protoplanets

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It is neccesary to study the detail of the growth stage, in which the planets should get the large fraction of the present mass. In the previous formation models of giant planets, spherical symmetry and no rotation are assumed. However, once the core instability occurs, the gas velocity of radial direction should become much faster than that before the instability. Hence, we expect that the gas disc is formed around the protoplanets and that the growth rate of the protoplanets depends on the mass transport rate of the disc. We calculate the mass transport rate of the disc as a function of the protoplanetary mass by two-dimensional numerical simulations.