DRIVING MECHANISM OF JETS AND OUTFLOWS IN THE STAR FORMATION PROCESS .

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Driving mechanism of jets and outflows in the star formation process is studied using three-dimensional resistive MHD nested grid simulations. Starting with a Bonnor-Ebert isothermal cloud rotating in a uniform magnetic field, we calculate the cloud evolution from the molecular cloud core to the stellar core. In the collapsing cloud core, we found two distinct flows. Low velocity flows ($\sim$ 5km/s) with a wide opening angle are driven from the large-scale adiabatic core, while high velocity flows ($\sim$ 30 km/s) with a good collimation are driven from the protostar. High velocity flows are enclosed by low velocity flows. The difference of the collimation between low and high velocity flow is caused by the magnetic effect. The difference of the flow speed is caused by the different depth of the gravitational potential between the adiabatic core and protostar. Low velocity flows correspond to observed molecular outflows, while high velocity flows corresponds to observed optical jets. Although it is considered that, in general, outflow is entrained by the jet, we suggest that outflow and jet are driven from the different cores.