

MHD JET LAUNCHING FROM YSOS : EQUATIONS AND INSTABILITIES

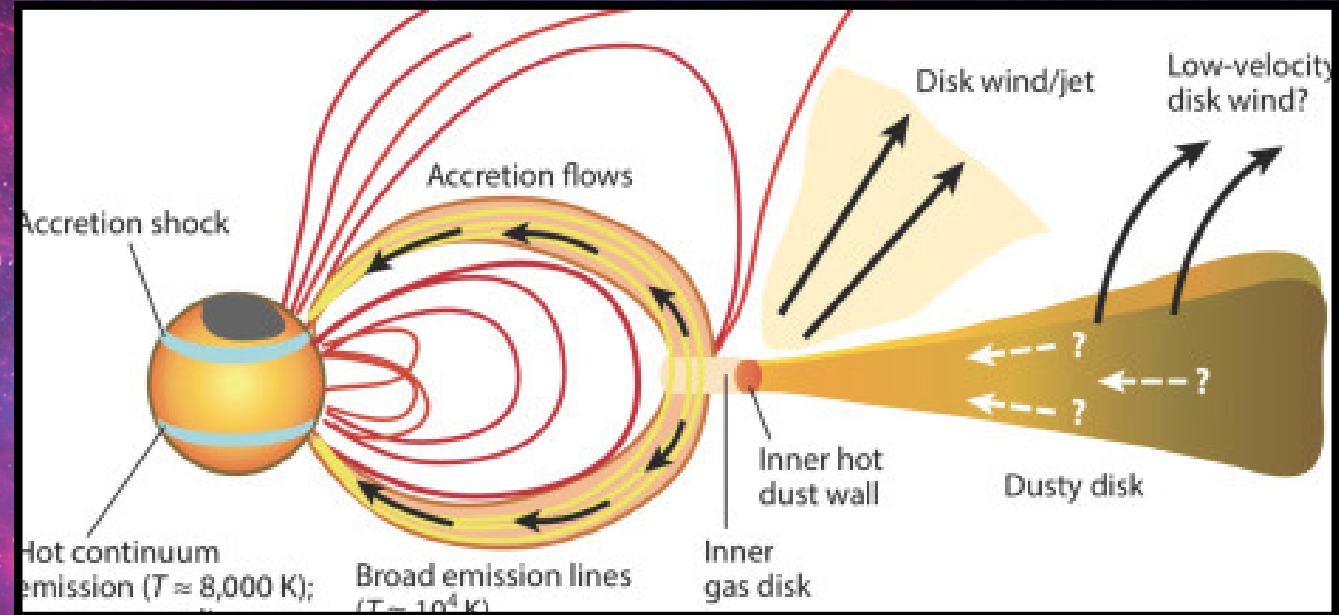
Magnetocentrifugal instability condition

$$3 \cos \theta - \sin \theta > 0 \implies \theta < 60^\circ$$

Wind velocity

$$v_{\text{wind}} \sim v_K \left(\frac{R_A}{R_0} \right)$$

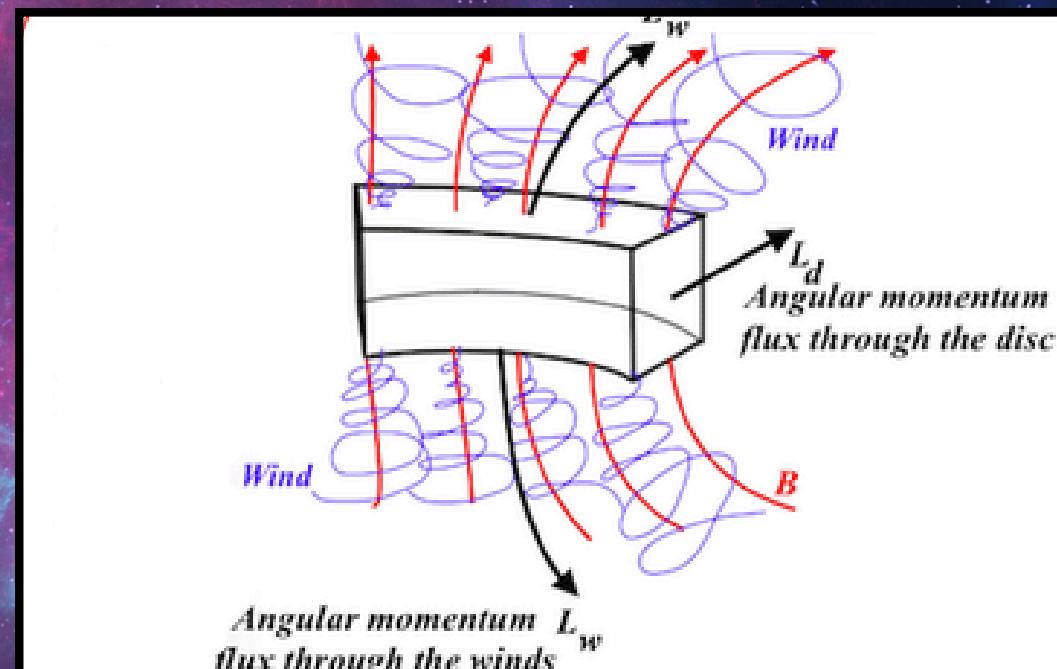
Credit: Hartmann et al. (2016)



Specific angular momentum of outflow

$$j_{\text{wind}} = R_A^2 \Omega_0$$

Illustration from Jafari & Vishniac 2018



Accretion/wind rate relationship

$$\dot{M}_a \sim \dot{M}_w \left(\frac{R_A}{R_0} \right)^2$$

Larmor's Formula

$$P = \frac{2}{3} \frac{e^2}{c^3} |\dot{\mathbf{v}}|^2$$

$$\frac{dP}{d\Omega} = \frac{e^2}{4\pi c^3} |\dot{\mathbf{v}}|^2 \sin^2 \Theta$$