



université
PARIS-SACLAY

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PLATO WP121 WORKSHOP - MAY 25

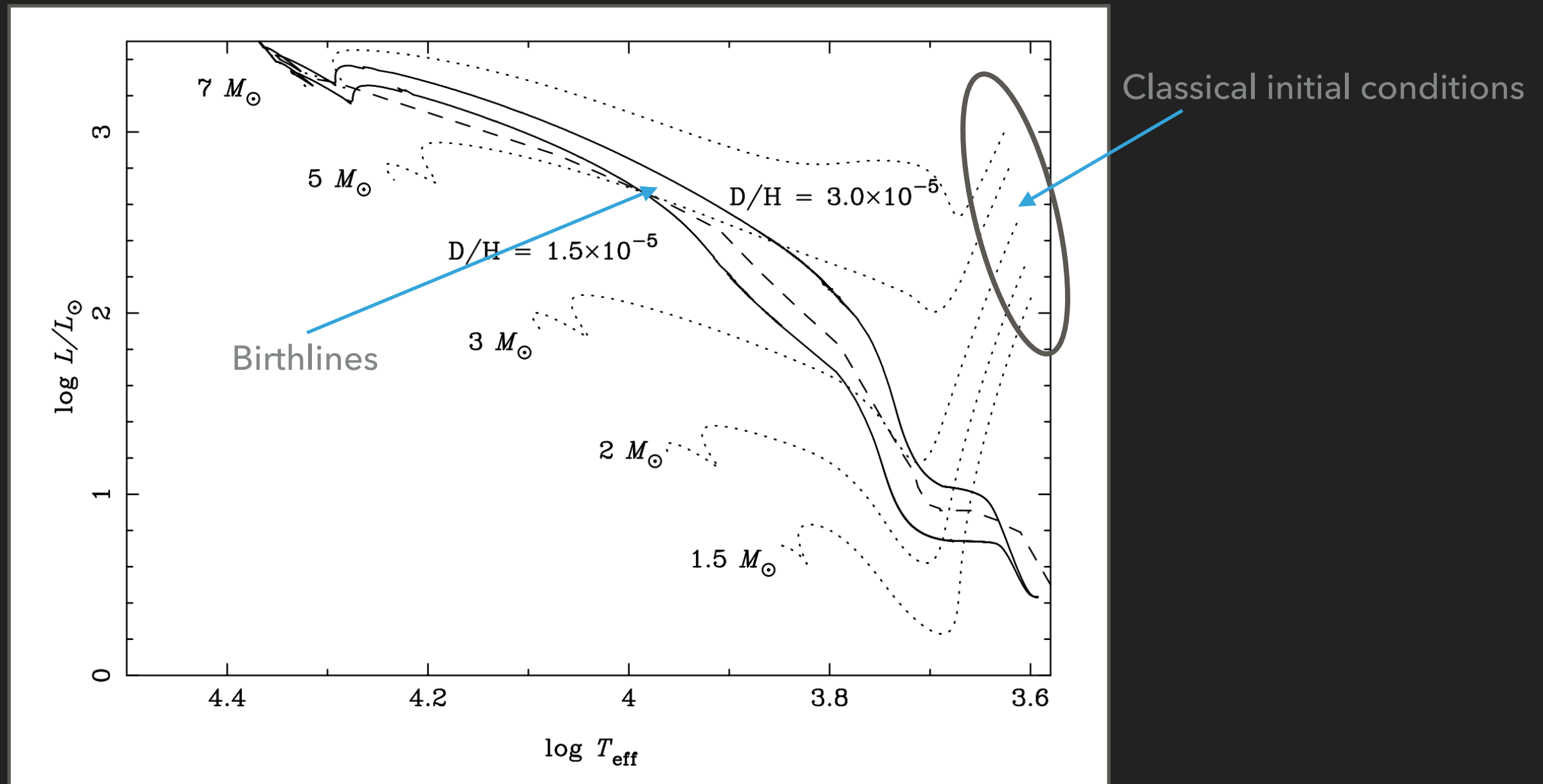
PMS EVOLUTION

THREE POINTS OF INTEREST

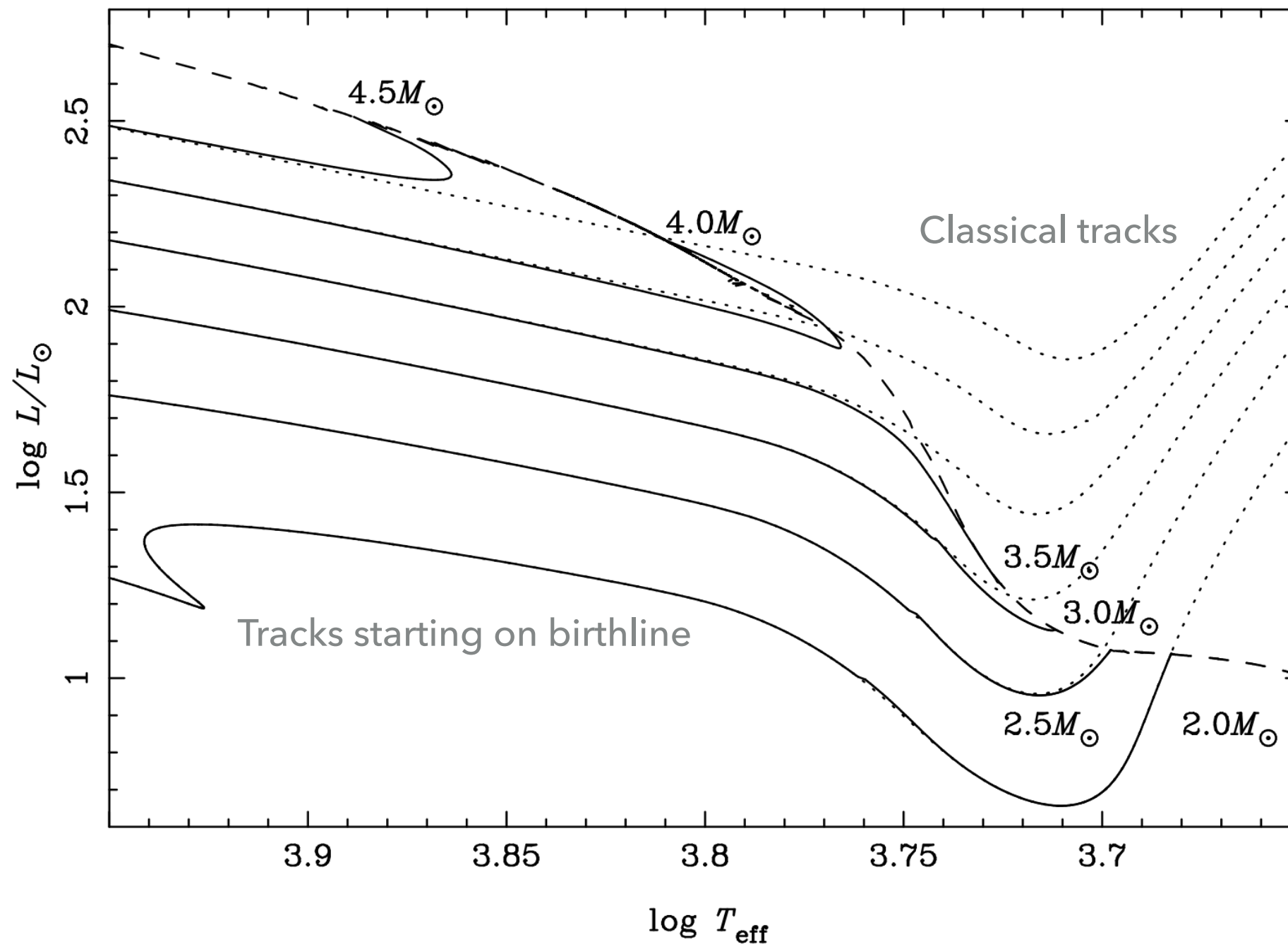
- ▶ PMS stars themselves
- ▶ PMS evolution as an initial condition
- ▶ Interaction with environment

PMS EVOLUTION ITSELF: INITIAL CONDITIONS

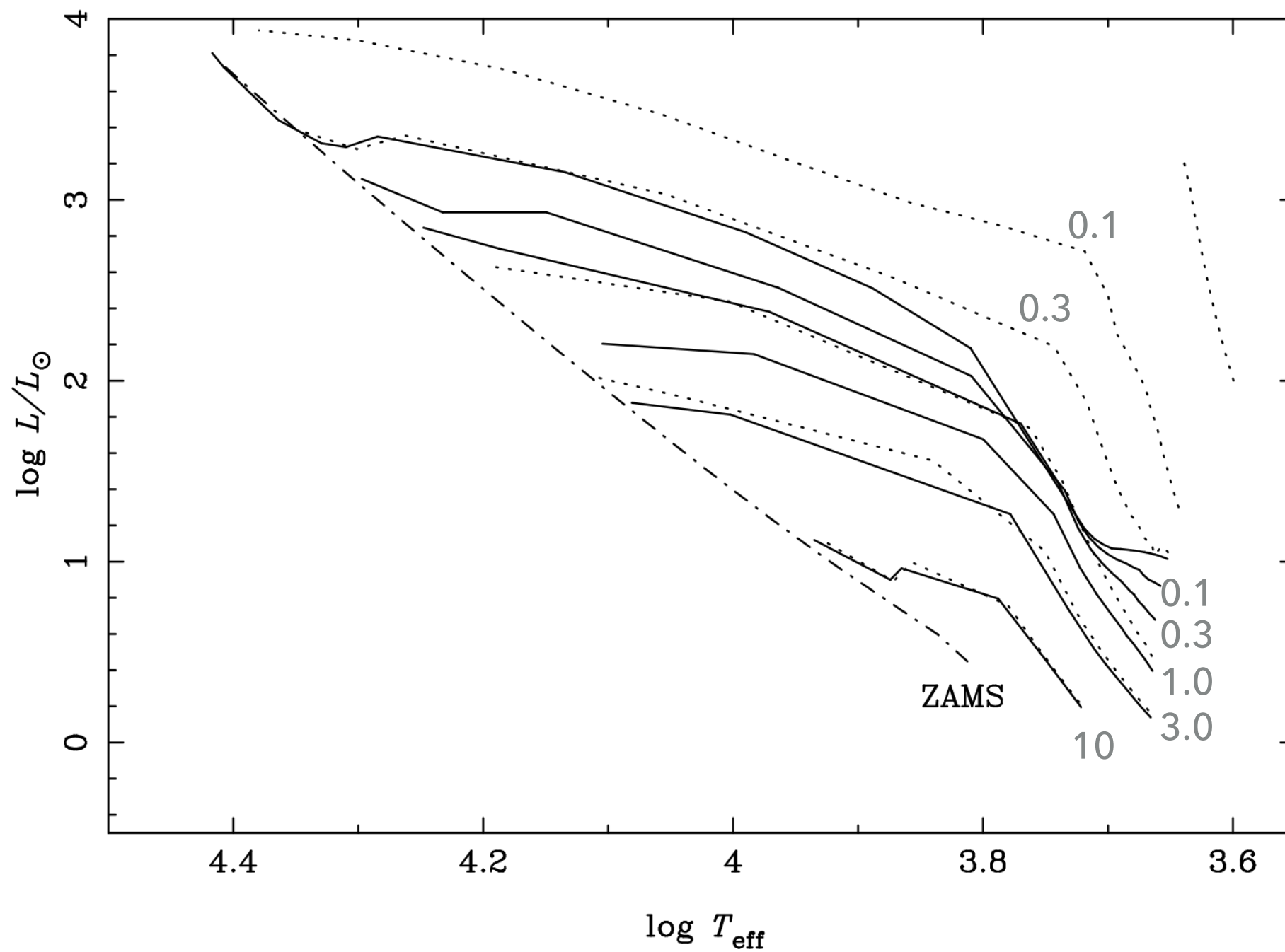
- Birthline: accreting protostar



PMS EVOLUTION: INFLUENCE OF THE INITIAL CONDITIONS



PMS EVOLUTION: AGES



PMS EVOLUTION ITSELF: THE PHYSICAL INGREDIENTS

- ▶ EoS, opacity, convection, atmospheres...
- ▶ Abundances, nuclear reaction rates
 - ▶ can be important when CNO dominates!

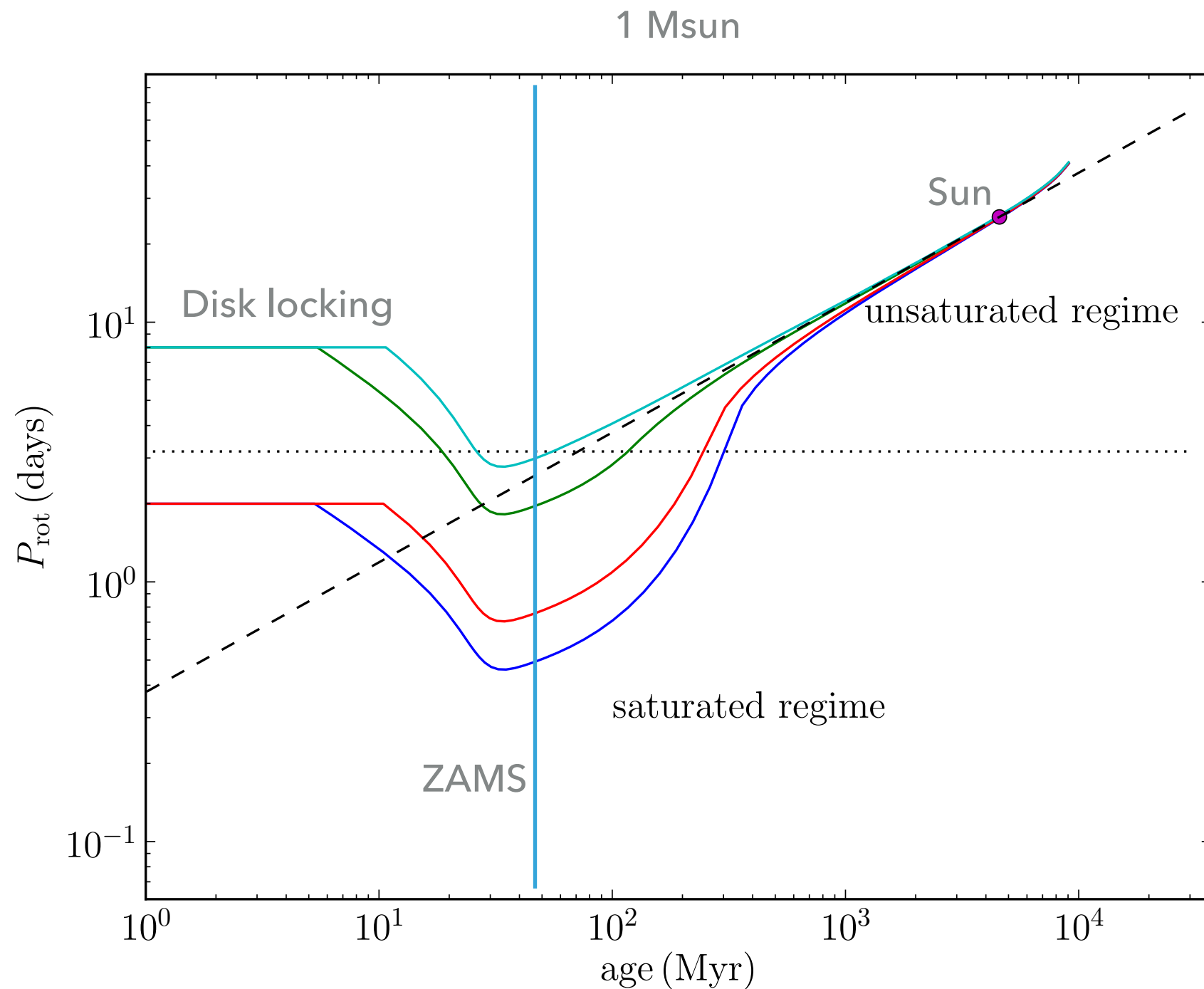
PMS EVOLUTION: CONVECTION AND THE RADIUS OF YOUNG STARS

- ▶ Radius of young stars ~5% higher
- ▶ Or α MLT lower than solar
 - ▶ Less efficient convection due to magnetic fields?
 - ▶ Modelling stars with magnetic fields
 - ▶ Or modelling convection with magnetic fields!

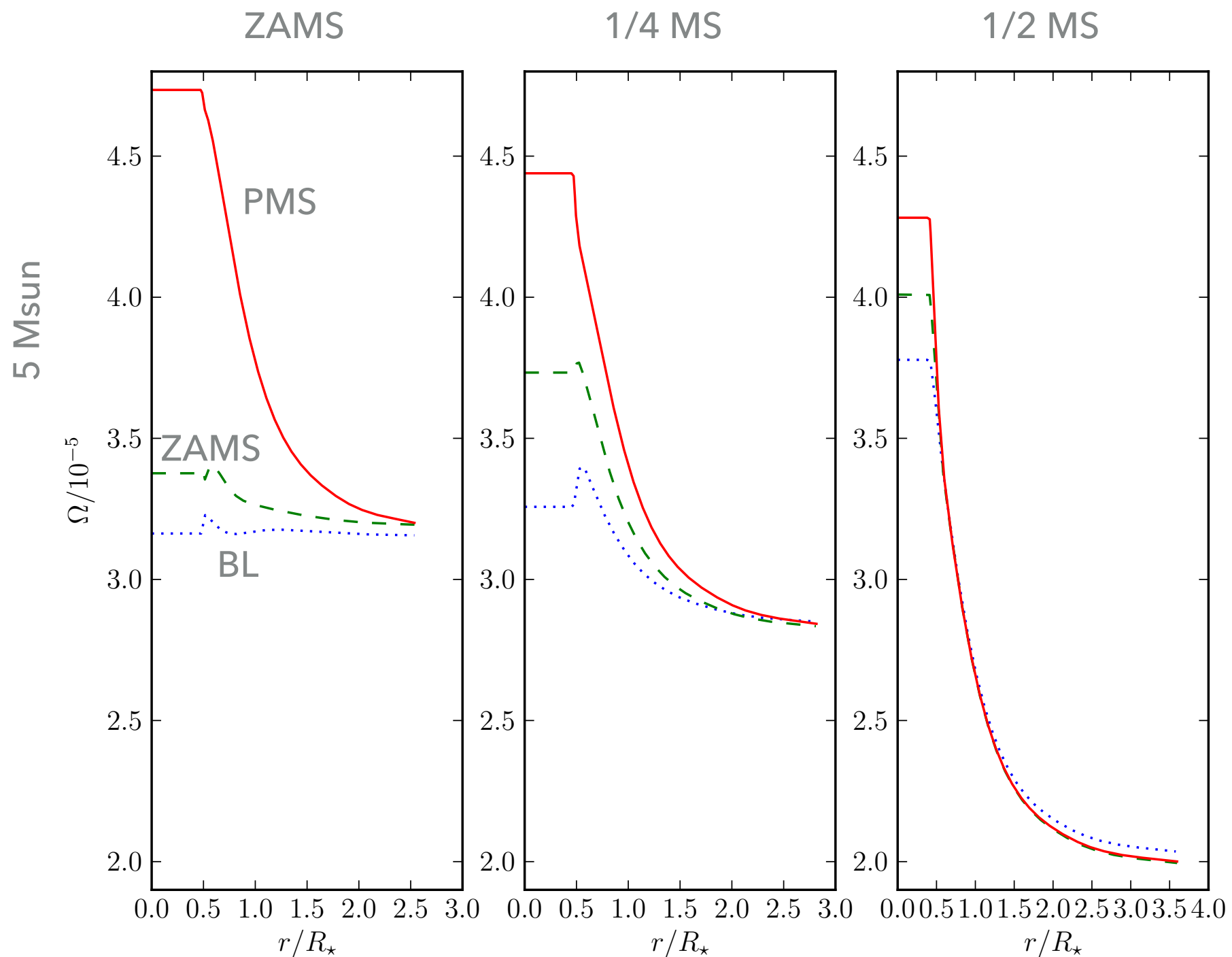
PMS STARS: THE ENVIRONMENT

- ▶ Interaction with an accreting disk
- ▶ Duration of the disk
 - ▶ Binarity, planets...
- ▶ Accretion

PMS AS INITIAL CONDITION: ROTATION



PMS AS INITIAL CONDITION: INTERNAL ROTATION



ACTIVITY, ROTATION, VARIABILITY AND ALL THAT

Orion nebula cluster in
X-rays (Chandra)

