

- GK PIC code ORB5 capable of investigating **Alfvén modes (AM)**, **energetic particles** and **turbulence**
- Ions/electrons treated gyrokinetically/drift-kinetically
- Global collisionless simulations of the whole radial domain
- AMs carry a large heat flux (10x higher than ITGs in this regime)
- AMs drive strong **zonal flows** (10x higher than ZFs excited by ITG turbulence in this regime)
- Next step 1: **Interaction of ZFs driven by AMs and turbulence**
- Next step 2: **Predictions for present/future tokamak experiments**

