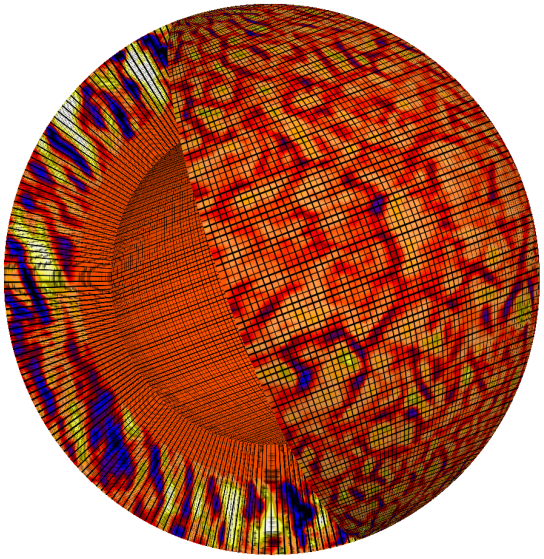
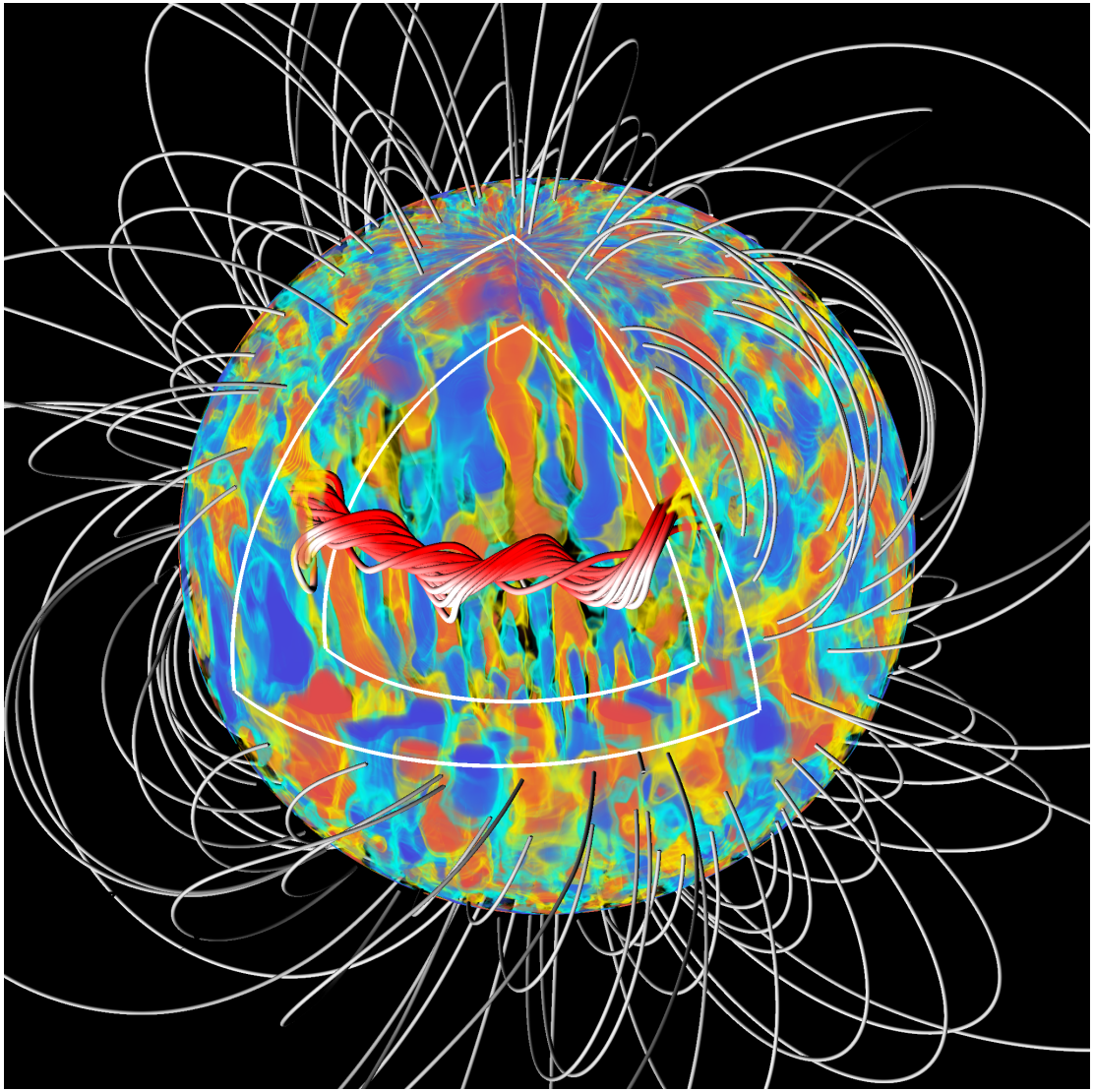
Global simulations of MHD solar convection

Anelastic MHD in a thick, rotating and stratified shell of thermally forced magnetized conducting fluid.

ILES simulation protocole based on EULAG-MHD code, developed at UdeM from HD version of EULAG

Based on minimally diffusive MPDATA NFT advection scheme, allowing to reach strongly turbulent regimes on relatively coase grids





www.astro.umontreal.ca/~paulchar/grps

Large-scale solar-like magnetic cycles

Simulations generate regular large-scale magnetic cycles with multidecadal periods, good hemispheric synchrony, kG-strengh magnetic fields, and cycle-driven rotational oscillations: all solar-like, and as yet unsurpassed!

Dynamically cosnsistent on all resolved spatial and temporal scales; thus allows to identify and quantify mechanisms leading to cycle variability, irradiance modulation, torsional oscillations, etc.