Three-dimensional reconnection in solar flares

Jaroslav Dudík, Juraj Lörincík (Astronomical Institute of the Czech Academy of Sciences) Guillaume Aulanier (Laboratoire de Physique des Plasmas, Paris & Rosseland Centre for Solar Physics, Oslo)

- Solar flare arcades are saddle-shaped
- Outer (cantle) loops are longer, higher, and rooted in ribbon hooks
- Cantles originate in ar-rf reconnection

New 3D reco: coronal Arcades + flux Rope → new Rope line + Flare loop (ar-rf)

- Spreading of double-J hooked ribbons away from PIL, with drift of flux rope footpoints:

Model (not event-specific)

- All four ar-rf reconnection components observed:

Lörincík et al. (2021, ApJL, 909, L4)