Two-ribbon eruptive flare without a filament eruption:

Slipping reconnection observed by SDO/AIA

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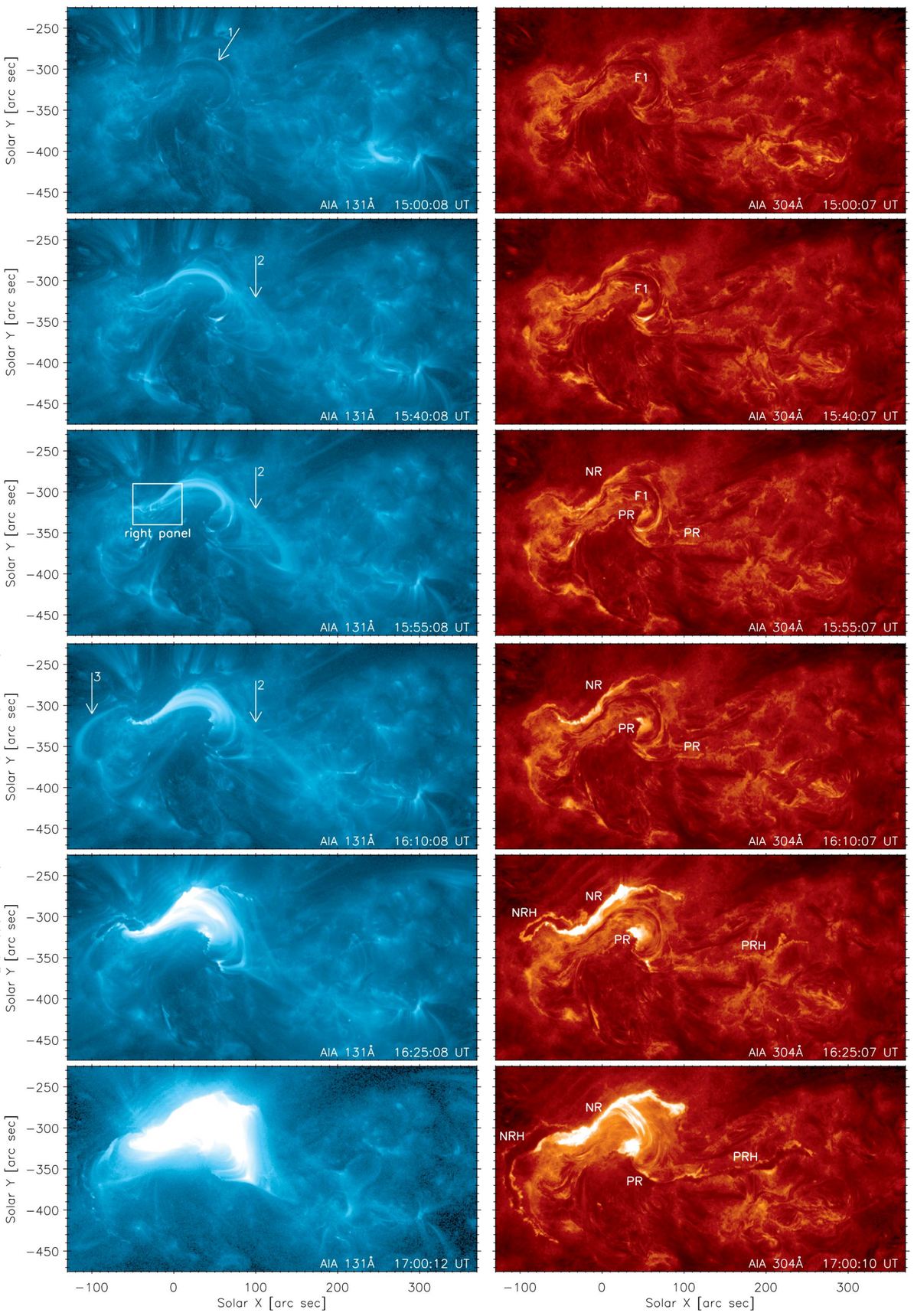
Introduction

- Magnetic reconnection generally difficult to observe
- In 3D, reconnection generally takes place at quasi-separatrix layers (QSLs) This reconnection should be **slipping – field lines continually move**
- **Field line slipping is expected in the 3D MHD models of eruptive flares** with torus-unstable, erupting flux ropes (*Aulanier et al. 2010, ApJ 708, 314)*
- **We present AIA observations of slipping loops during an X-class flare**

Flare Overview



F1 *– active region filament*

Arrow 1 *– first flare loop*

Arrows 2, 3 *– erupting hot loops (10 MK)*

NR *– negative-polarity ribbon*

PR *– positive-polarity ribbon*

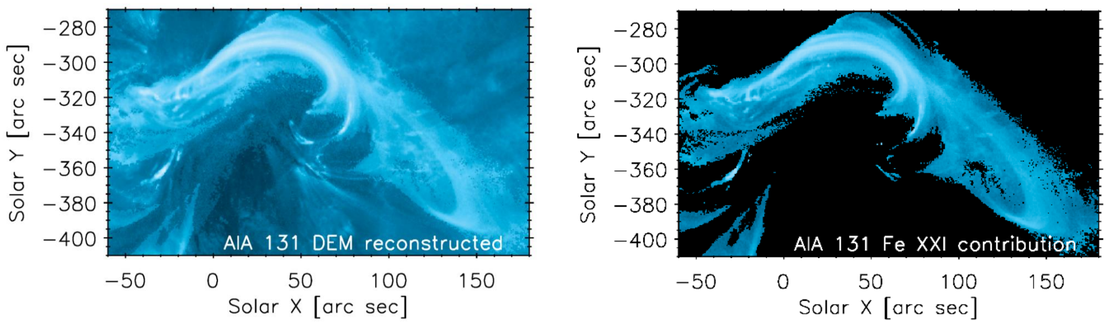
NRH *– hook of the NR*

PRH *– hook of the PR*

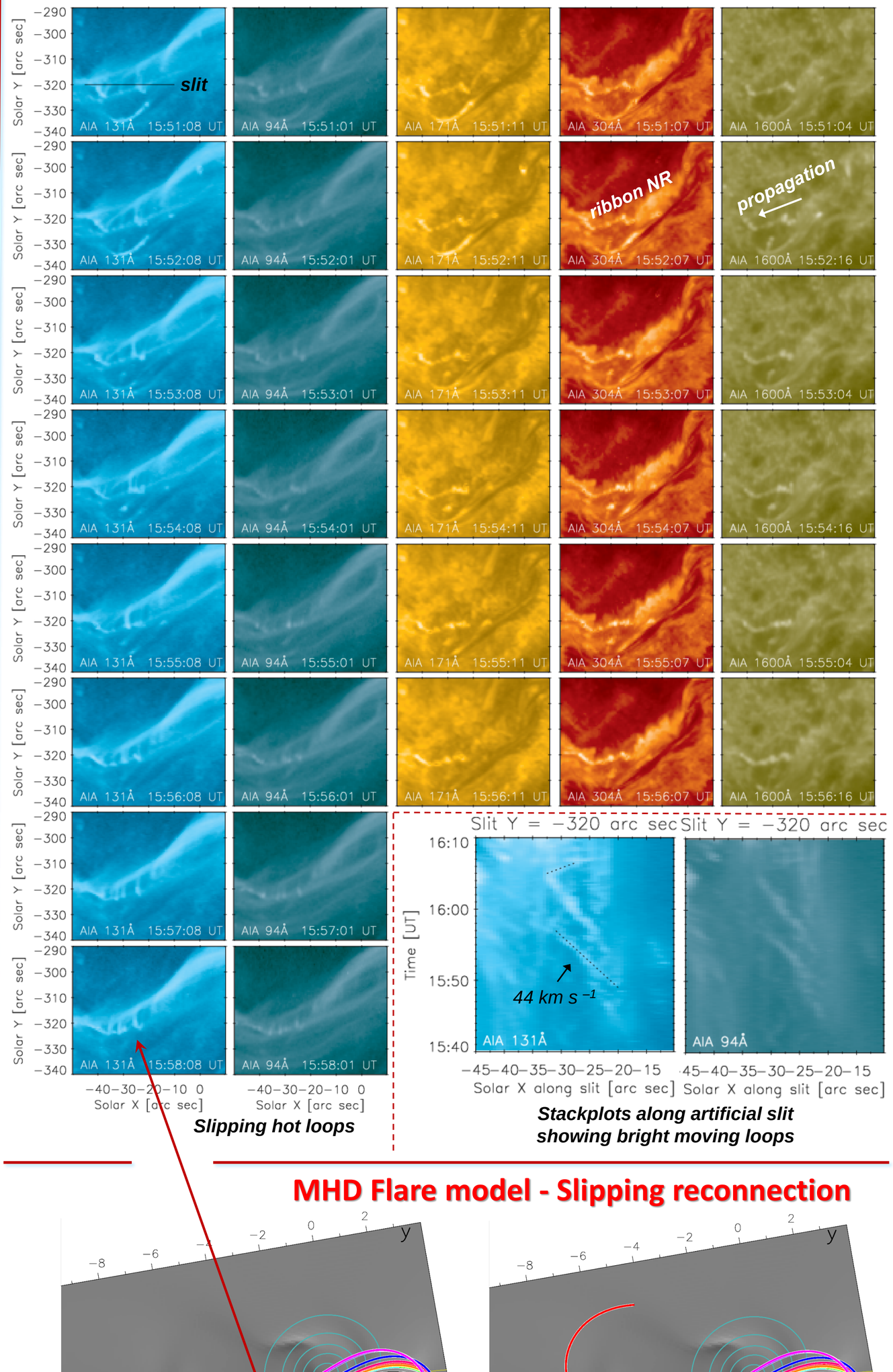
Key Points:

- **Filament F1 does not erupt**, stays visible even at 16:25 UT
- **Some hot loops** (Arrow 2, AIA 131Å) **grow, slip along PRH, and erupt**
- **Multiple slipping events** (one example on the right)
- **Brightenings moving along ribbons in AIA 1600Å are footpoints of hot, ~10 MK slipping flare loops (AIA 131Å)**
- These **hot loops emit** in Fe XVIII – **Fe XXI (below)** – Fe XXIV

Fe XXI emission from DEM reconstruction



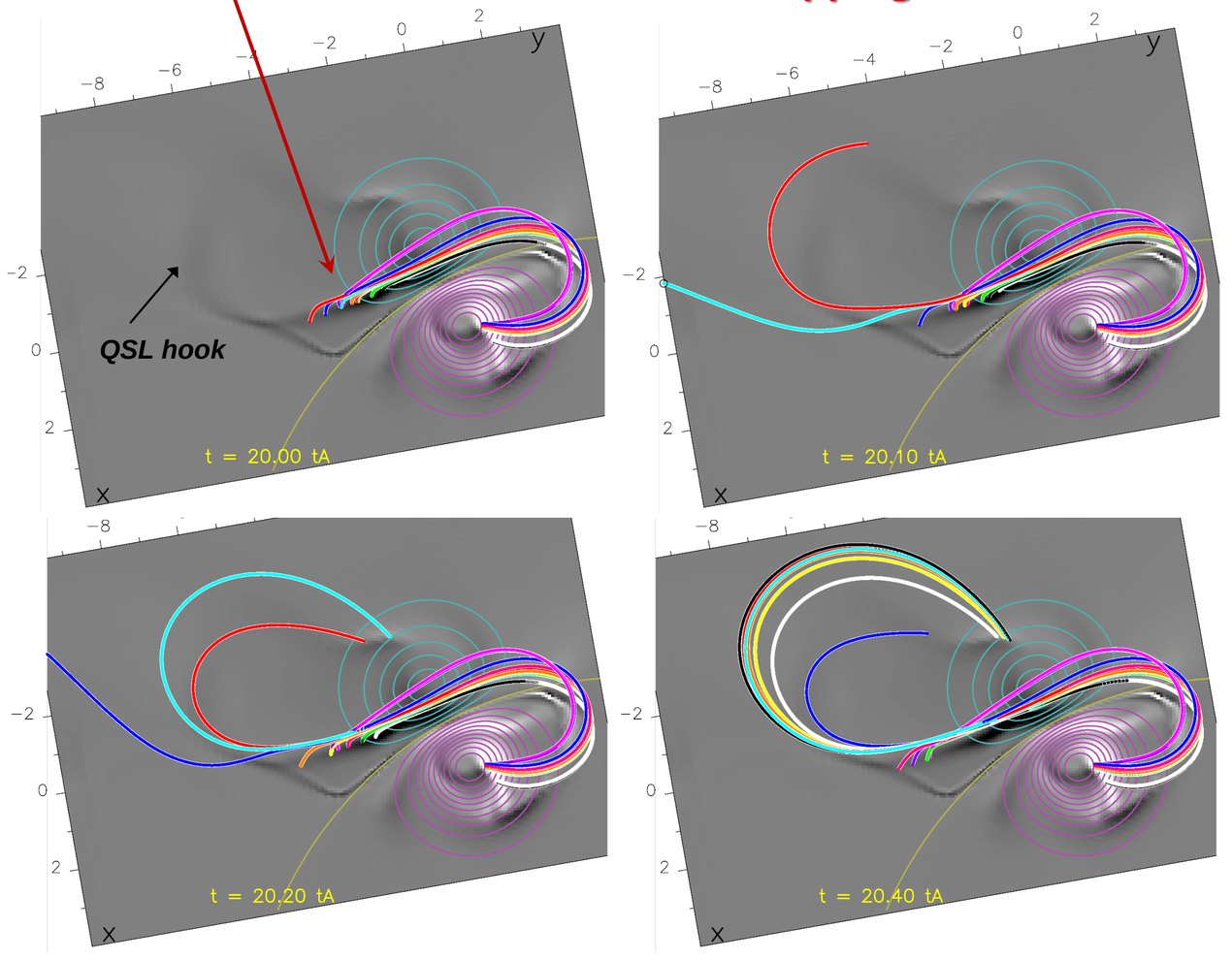
Slipping hot loops – an example



Slipping hot loops

Stackplots along artificial slit showing bright moving loops

MHD Flare model - Slipping reconnection



Aulanier et al. (2012), A&A 543, A110; Janvier et al. (2013), A&A accepted

ACKNOWLEDGEMENTS

This work was supported by the Royal Society via the Newton International Fellowship Programme. JD acknowledges grant of Scientific Grant Agency, VEGA, Slovakia, Grant. No. 1/0240/11. The work of MJ is funded by a contract from the AXA Research Fund. MK acknowledges Grant No. 209/12/0103 of the Grant Agency of the Czech Republic. CHIANTI atomic database and software was used to calculate the AIA responses and produce the DEM reconstruction. CHIANTI is a collaborative project involving the NRL (USA), the Universities of Florence (Italy) and Cambridge (UK), and George Mason University (USA).