The X.1 flare observed on 22 October 2014 (SOL2014-10-22T14:28) was among the strongest flares occurred in the magnetically complex, great active region NOAA 12192. It was a confined flare, without an accompanying CME, despite the large amount of released energy. In our work we attempt to deepen our understanding of the magnetic field configuration of the AR 12192. We analyzed the polarization signatures during the flare using spectro-polarimetric data acquired by the IBIS/DST instrument along the photospheric Fe I 6173 nm and the chromospheric Ca II 854.2 nm lines in a time interval immediately following the peak of the X.1 flare. The results provided evidence of significant changes in the magnetic field configuration during the analyzed time interval.

### Weak Field Approximation

When the Zeeman separation induced by the magnetic field in a spectral line $\Delta \lambda_B$ is smaller than $\Delta \lambda_D$, the Doppler width due to the thermal motion, at any optical depth we can get a relationship between $V$ and $\frac{d \lambda}{dx}$, from which it is possible to obtain the value of the magnetic field along the LOS direction $B_{LOS} = B \cos \theta$:

$$V = -\frac{g}{2} \Delta \lambda_B \cos \theta \frac{d \lambda}{dx}$$  

The Zeeman splitting is

$$\Delta \lambda_B = \frac{e}{4 \pi m_e c} B_{LOS}^2 = 4.668 \times 10^{-13} B_{LOS}^2$$  

We put for CaII 854 Å, $g = 1.1$ (Kleint, 2017) and for FeI 673Å, $g = 2.5$ (Landi Degl’Innocenti, 1982).

### Determination of the magnetic field changes

The temporal variation of the magnetic field occurring during a flare can be characterized at the first order by a step function (Sudol and Harvey, 2005):

$$B(t) = a + b t + \alpha \left(1 + \frac{2}{\pi} \arctan(n(t - t_0)) \right)$$  (3)

- $a$ is the half amplitude of the step, $\alpha$ is the amplitude of the step and it represents the measure of the change in the magnetic field, $dB$.
- $\frac{2}{\pi} \arctan(n(t - t_0))$ is the time interval at which the stepwise change occurs, $dt$.

### Results

- A consistent change of the longitudinal magnetic field occurred in the ribbon in chromosphere.
- The location of the chromospheric changes are unrelated to the location of the changes in photosphere.
- We did not find an evident correlation between the magnetic field strength and the magnitude of the magnetic field changes.
- The distribution of the magnetic field change is more asymmetric in chromosphere than in photosphere.
- Fast and abrupt changes are more frequent than slow changes both in chromosphere and in photosphere.

### Bibliography