Halpha Imaging Spectroscopy of a C-class Flare with IBIS

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We present a rare high cadence and high spatial resolution spectroscopic observation of a C4.1 Flare taken with the Interferometric Bidimensional Spectrometer (IBIS) in conjunction with the adaptive optics system at the 76 cm Dunn Solar Telescope on 2011 October 22 in NOAA AR 11324. The IBIS with a round FOV of 90" x 90" and 0.1"/pixel detector image scale scanned the Halpha line from 6561.1 to 6563.8 Angstrom with 0.1 Angstrom stepsize for 28 steps. Each scan takes about 4.8 s. The flare occurred in a mixed polarity region with two parasite configurations. The flare shows multiple bright ribbons in the chromosphere spreading over a region of 120" x 60". IBIS observed a remote ribbon of the flare and fully covered its temporal evolution. The Halpha emission integrated over this ribbon area exhibits several bursts over four minutes during the flare impulsive phase that are temporally correlated with the subpeaks of RHESSI hard X-ray (HXR) light curves. During the strong bursts of the Halpha emission, we observe a central reversal patten in the Halpha line core, which is believed to be a signature of nonthermal process caused by direct electron precipitation. The line core shows blueward shift that increases with the Halpha emission, which might be related to chromospheric evaporation. The Halpha emission is stronger in the red wing than in the blue wing during the strong bursts. Substructures within the ribbon are also identified. A bright core feature that is 30% brighter than the entire ribbon moves at an apparent velocity of about 30 km/s within the ribbon during the strongest burst of Halpha emission co-temporal with a strong subpeak of HXR. The bright core disappeared in the decay phase of the flare. We suggest that this running bright core feature tracks the site of electron precipitation.