CLASP/SJ observation of time variations of Lyman-alpha emissions in a solar active region


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The Chromospheric Lyman-alpha SpectroPolarimeter (CLASP) is a sounding rocket experiment launched on September 3, 2015 to investigate the solar chromosphere, and the slit-jaw (SJ) optical system took Lyman-alpha images with the high time cadence of 0.6 s. By the CLASP/SJ Observation, many small time variations in the solar chromosphere with the time scale of <1 minute were discovered (details will be presented by Kubo et al.). An active region with a low activity was inside the CLASP/SJ field of view, and the time variations are seen in both of in the active and quiescent regions. We focused on the active region and investigated the time variations and relation to the spatial structure observed by SDO/AIA. As the result, it was found that the time scales of the Lyman-alpha time variations were ~30 s, and the amplitudes of the time variations were more in regions with strong Lyman-alpha intensities. Differently from the quiescent region, no significant propagating motion was found. By comparing to the AIA images, no significant time variation by AIA corresponding to the Lyman-alpha time variations was observed. We compared the Lyman-alpha time variations in hot loop footpoints observed by AIA 193 Å and cool loop footpoints observed by AIA 171 Å, and no significant difference were seen. These results suggest that this phenomenon is not directly responsible for the heating of the corona. In this presentation, we summarize features of this phenomenon and investigate a physical picture.