FLOW INSTABILITIES IN SOLAR JETS

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Kelvin–Helmholtz instability (KHI) and Raleigh–Taylor instability (RTI) are basic physical processes in fluids and magnetized plasmas. Using high-resolution data from the Interface Region Imaging Spectrograph (IRIS), we study the development of the KHI in a blowout jet. Two upward flows pass along the left boundary of the jet successively. Next, KHI develops due to a strong velocity shear ($\sim 204$ km s$^{-1}$) between these two flows, and subsequently the smooth left boundary exhibits a sawtooth pattern, evidencing the onset of the KHI. Using the Atmospheric Imaging Assembly 304 Å images obtained from the Solar Dynamics Observatory, we observe that many vortex-like structures occur during the upstream and downstream regimes of the jets, i.e., when the jets eject upwards to the corona and fall down from the higher atmosphere. Comparing the observations with the theoretical estimation, we suggest that the vortex-like structures in the upstream regime of the jet are manifestations of the KHI, and the vortex-like structures in the downstream regime may be caused by both the RTI and KHI.