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EXTREMELY HIGH-VELOCITY UV OUTFLOWS IN THE MOST LUMINOUS QSOS AT COSMIC NOON: DISCOVERY, IMPLICATIONS & PERSPECTIVES

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We are performing an investigation of ionized extremely high-velocity (∼0.1-0.3c) outflows (EHVOs) imprinting their signatures in the UV band of most luminous QSOs shining at Cosmic noon, finding them in 1 out of 10 quasars. Such large velocities imply large kinetic energy rate ($\propto v^3$), therefore EHVOs are believed to play a major role in communicating the huge SMBH accretion luminosity to the gas reservoir in the host. Broad absorption lines (BALs) probe quasar outflows originating from the inner regions around the black hole, providing us unparalleled insight in the structure of quasar central engines. Studying the variability of these BALs can help us to understand their structure, temporal evolution, and key physical properties. Remarkably, we have recently discovered a multi-component EHVO UV BAL in CIV line in an hyper-luminous quasar at z∼3.6 exhibiting complex variability in each component at five different epochs, spanning 17 yr in the observed frame. I will discuss the possible mechanisms responsible for the variability, which allow us to derive the location and kinematics of the outflow, and the role of these powerful EHVO UV outflows as a promising mechanism for feedback in luminous quasars. Finally the measured extreme velocities (∼0.2 c) in these BAL UFOs are similar to the UFOs typically observed in the X-ray spectra of local AGN. However, while X-ray UFOs require time consuming observations to be studied, the study of UV UFOs variability can be performed by routine observations even at high redshifts. I will briefly present an overview of future perspectives in this blooming research field.