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SDO/AIA observations of periodic and quasi-periodic phenomenon associated with an EUV jet

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It has long been advocated that explosive magnetic activity is responsible for the mass-balance in the solar atmosphere, supplying the corona and the solar wind with heated plasma. The explosive events are thought to be the result of emerging bi-polar (EB) regions reconnecting with pre-existing, open fields, with the size of the EB's (i.e. granular, super-granular) being related to size of the resulting feature (i.e. spicules, EUV/X-ray jets). Recent evidence has suggested a deeper relationship between spicules and EUV jets (Sterling et al., 2010).

We present here observations of a EUV jet observed with SDO/AIA close to a southern coronal hole. The jet can be considered as a 'Blowout jet' (using the terminology of Moore et al., 2010), launching vast amounts of chromospheric plasma into the atmosphere along with hotter material. The hotter part of the jet appears to be composed of multiple, (quasi-)periodic ejections that individually resemble fast moving (>100 km/s) spicules. The multiple ejections appear crucial for distributing the hotter material high into the corona, possibly suggesting that larger EUV/X-ray are composed of many smaller spicule-like events. Although the event is close to the limb, evidence for reconnection at the chromospheric level is provided. Further, evidence for helicity (or torsional motion) and the presence of slow and fast Magnetohydrodynamic waves is given, with the wave mode excitation likely due to the reconnection process. Exploiting the observed wave motion, we also use magneto-seismological techniques to determine local plasma parameters with sub-resolution accuracy along one of the jets unique features.