Solar wind, a stream of supersonic plasma emanating from the solar corona, serves as an ideal laboratory for a study of high Reynolds number plasma flows. Turbulent processes that govern the dynamics of the so-called inertial range, i.e., the spatial scales smaller than energy injection scales but larger than the scales where the dissipation processes set in, have been studied for decades. At present, it is believed that the large-scale free energy in a form of kinetic and magnetic fluctuations is transferred via turbulent cascade into smaller scales, where kinetic effects become dominant and heating takes place. In order to understand dissipation processes, high-cadence measurements of solar wind parameters are necessary. The bright monitor of the solar wind (BMSW) instrument on board the Spektr-R spacecraft provides such data, and in tandem with high-cadence measurements of the magnetic field from the Wind spacecraft, we are able address the nature of the sub-ion scale fluctuations. The thesis focus on three interconnected topics, (a) what changes are induced by the passage of a collisionless IP shock in the framework of turbulence, (b) study of a decay of the turbulent energy downstream an IP shock, and (c) identifying the dominant mode of the sub-ion scale fluctuations.