## U09a  Probing the Primordial Power Spectrum at Small Scales

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The standard cosmological model, $\Lambda$CDM model, enjoys the great success that it is consistent with virtualy all the observed large-scale structure. However, it does not mean that the extrapolation of the model to very small length scales accurately describes the corresponding structure. It is important to note that the exact mechanism of the generation of the primordial density fluctuations remains unknown. We explore the possibility of a family of exotic primordial power spectra predicted by variants of inflationary theory. The Press-Schechter formalism is used as an analytical approach to quantify the difference of dark matter distribution at small length- and mass-scales. The surviving probability for solar-mass size dark-matter halos near the solar system and their ability to cause microlensing are explicitly calculated. We also study the $\mu$-distortion of CMB to constrain the deviation from standard primordial power spectrum, to discuss an extreme but possible case, in which the analytical result suggests that high-density small-mass halos are likely to survive from tidal stripping but unlikely to cause microlensing. Finally, N-body simulations are used to test our analytical results.