

Yi-Peng Wu: Statistical bias for black hole mass functions from the inflationary power spectrum

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The spatial configuration near local extrema of the primordial density perturbation restricts the statistics of high-density peaks valid for the formation of primordial black holes (PBHs). We argue that the condition for density extrema to be maxima in the peak statistics leads to an universal enhancement to the extended mass function of PBH estimated by the Press-Schechter method. For the inflationary spectrum in the narrow-spike class, the mass function from the peak theory is up-lifted in all mass range, indicating a severer constraint to models in the favor of considering PBHs as all dark matter.