

宇宙の進化と素粒子模型

宇宙線研理論グループ

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Formation of Intermediate BHs as PBHs in the inflationary cosmology with running spectral index

arXiv:0711.3886 [astro-ph]

東大宇宙線研 : 川崎、高山

青山学院大 : 川口、山口

東大理 : 横山

Intermediate-mass BH

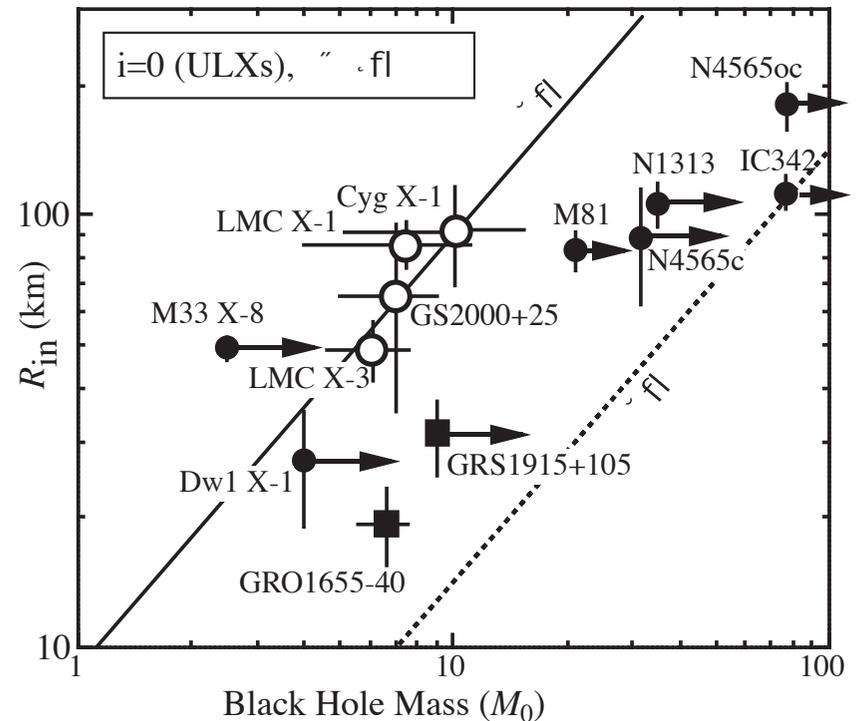
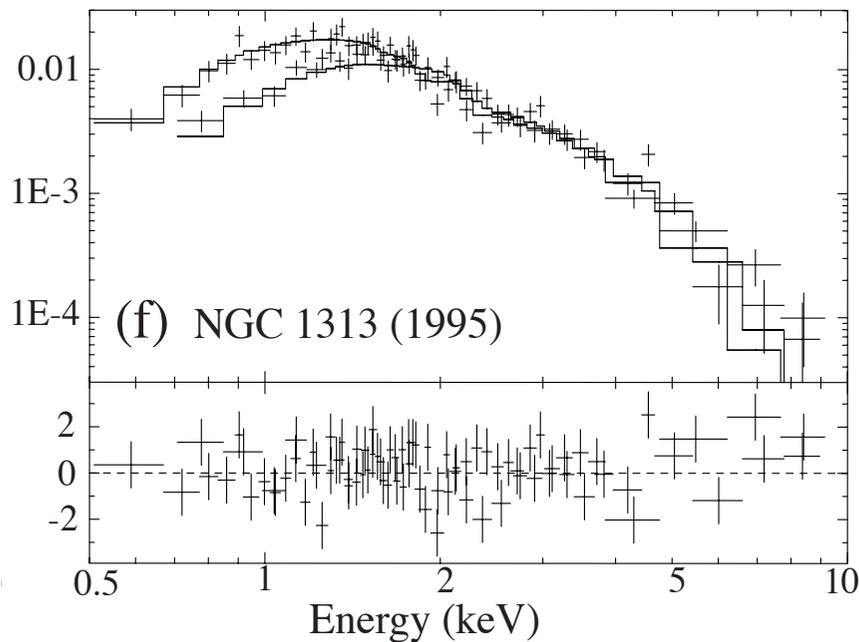
- Ultraluminous X-ray sources (ULXs)

- Luminosity
- X-ray variability

➡ Intermediate-mass BH
if $<$ Eddington luminosity

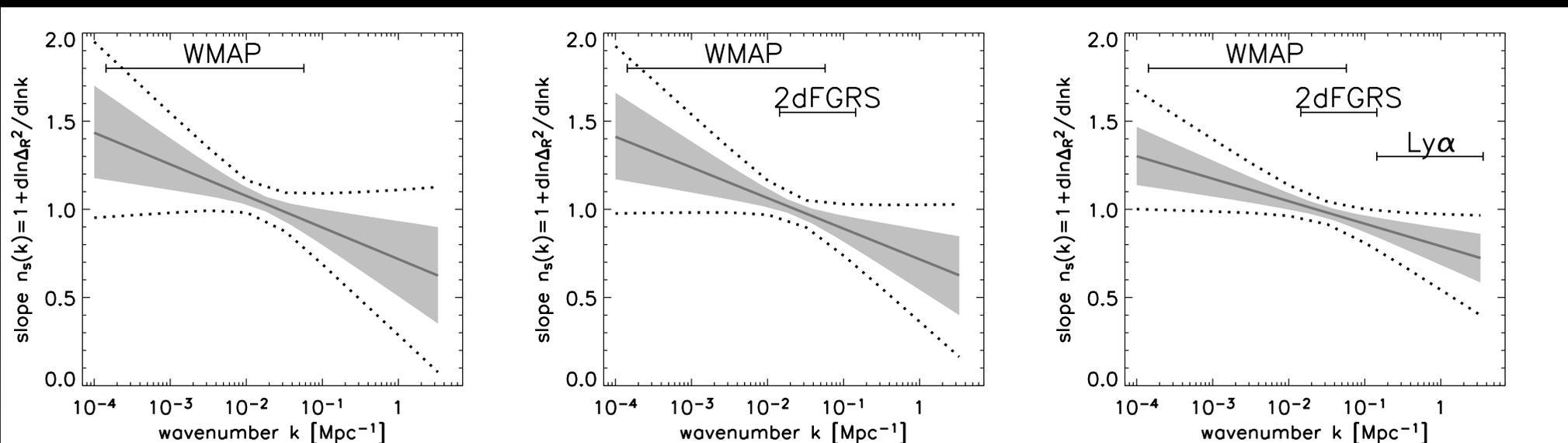


Makishima et al (2000)

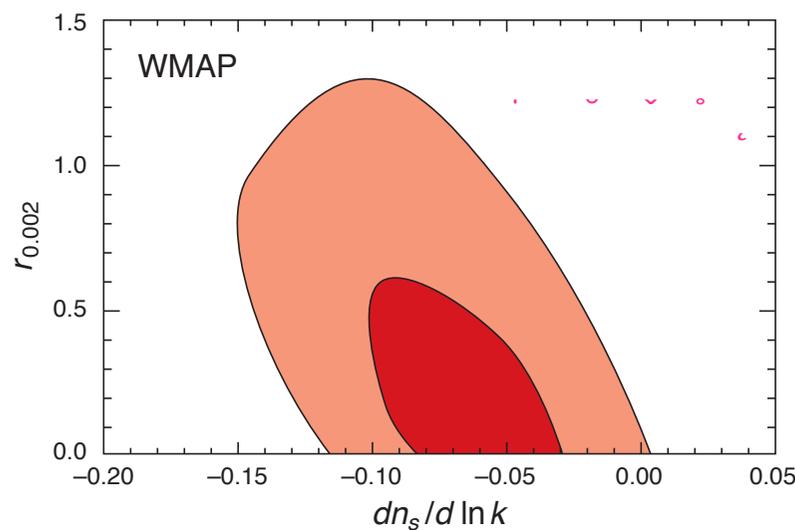
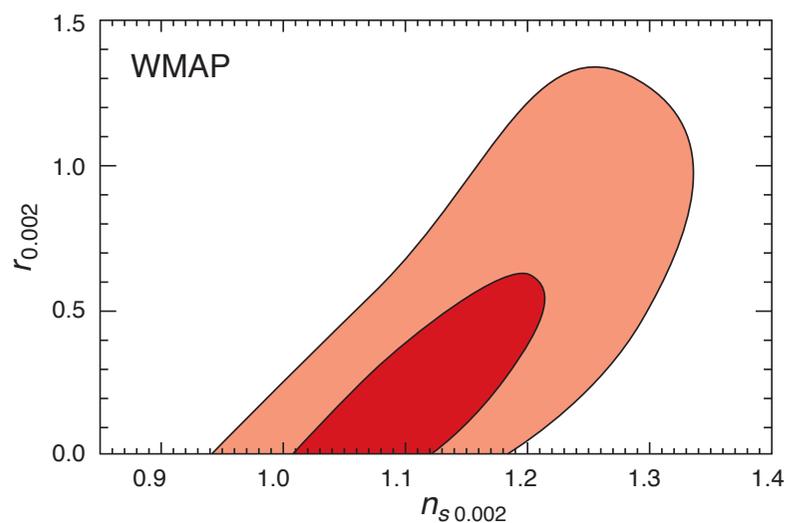


BH formation in double inflation

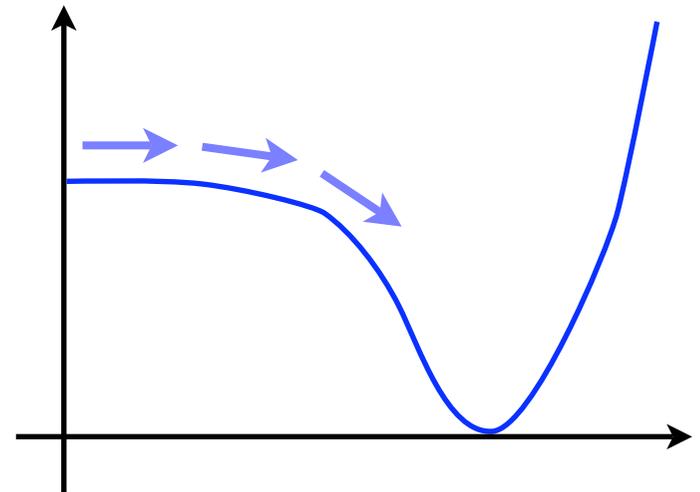
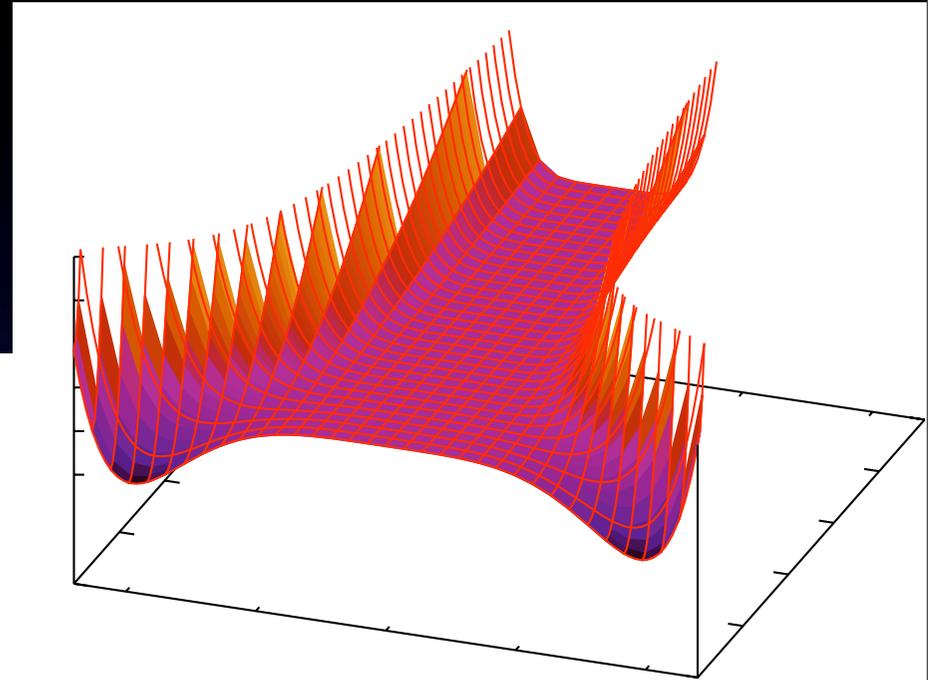
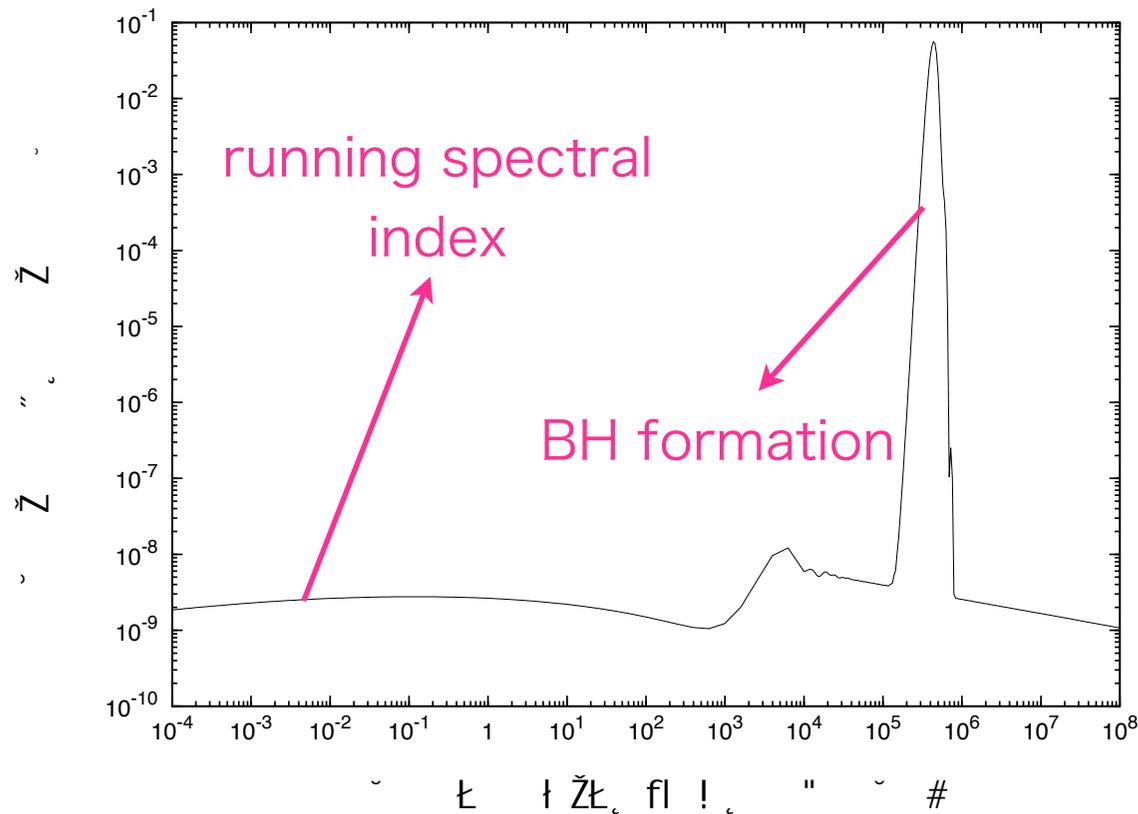
- WMAP 1st year suggested the power spectrum of the density fluctuations with running spectral index



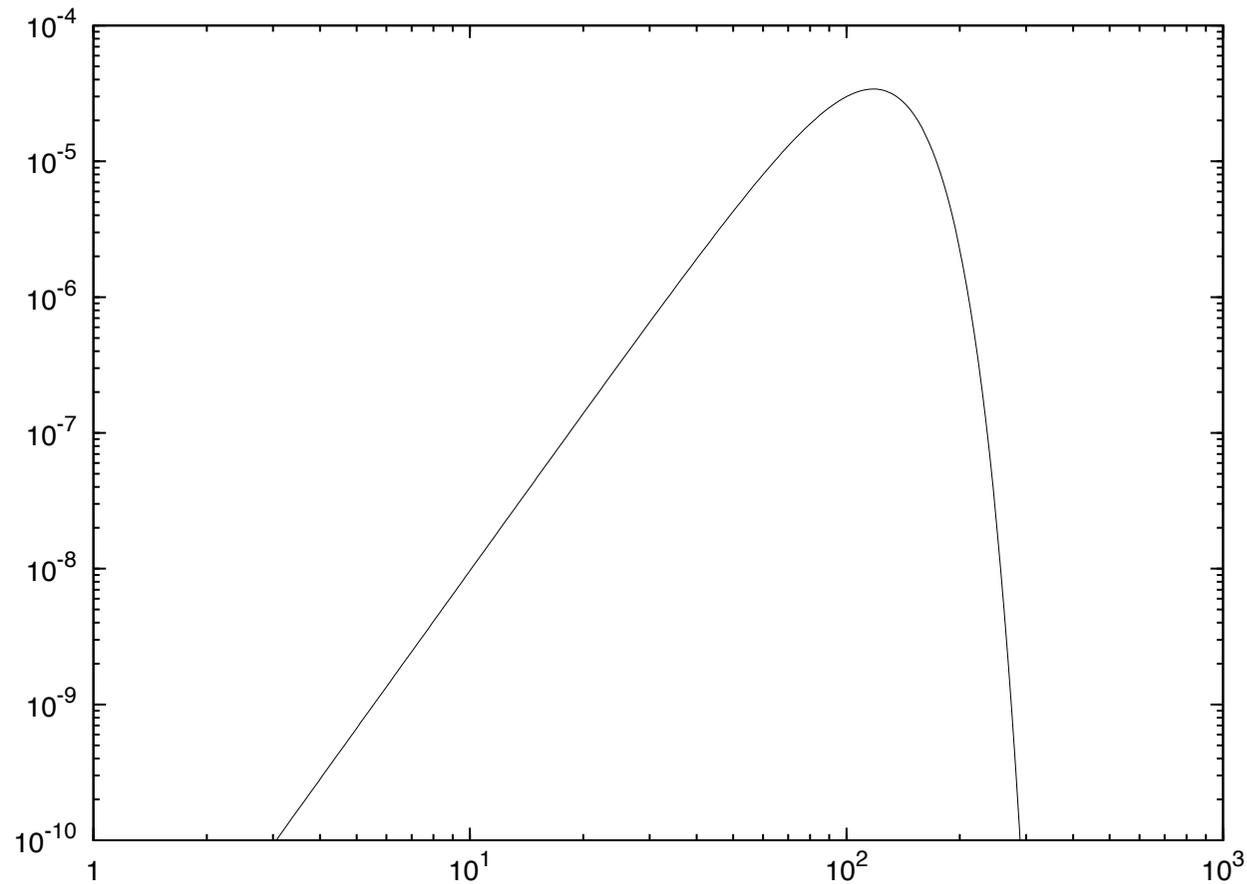
WMAP3



- Double inflation Kawaguchi, Kawasaki, Takayama, Yanaguchi, Yokoyama (2007)
- Smooth hybrid inflation
- new inflation



BH Mass spectrum



Observations imply $\Omega_{\text{IMBH}} \sim 10^{-4.5}$

