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Evolution of the mass spectrum of primordial black holes in the Friedmann Universe

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We investigated the evolution of the mass spectrum of primordial black holes (PBHs) in the expanding Universe under the action of Bondi-Hoyle-Lyttleton accretion and Hawking radiation. The initial mass spectrum of primordial black holes was assumed to be flat (independent of mass). It was shown that accretion of matter surrounding a black hole does not significantly affect the growth of the mass of black holes. Using modeling, it was found that by the end of the radiation-dominated era, all primordial black holes with masses up to $M = 2 \times 10^9$ g had evaporated. We also confirmed the critical mass value for primordial black holes, at which they evaporate in our time. It is $M_{cr} = 2 \times 10^{14}$ g.

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