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Minxi He: On the formation threshold of rotating primordial black holes

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The spin of black holes is one of the important observables in gravitational wave detection. As LIGO/Virgo have found a number of events of black hole mergers and some of them are of small effective spins, one possibility is that these black holes are primordial because it is believed that primordial black holes (PBH) have small spin. One important factor that affects the spin distribution of PBHs is the modified formation threshold by rotation. We discuss the effect of the angular momentum on the formation threshold of primordial black holes formed in the radiation-dominated epoch by direct gravitational collapse of large primordial density perturbations. We find that the threshold is increased in proportional to the square of the angular momentum.