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Mass and spin constraint on black holes associated with long GRB's in Collapsar model.

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Gamma ray bursts are highly energetic and brightest explosions that have been observed in EM spectrum. These can last from few seconds to few hours. The progenitors of long GRBs are believed to be massive stars exploding due to the collapse of their cores. Matter from the star around the core falls down towards the center forming a gaseous envelope and (for rapidly rotating stars) swirls into a highly density accretion disk. In my talk, I will present our results showing how much mass and spin a newly formed black hole should possess during collapsar to launch long GRB. In our model, We start with a newly formed black hole whose mass and spin are going to evolve depending on the rotation of the collapsing cloud. We set a critical angular momentum of the cloud at certain circular radii and we further study the growth of black hole in sub critical, critical and super critical regime. In addition to metric change effects on the evolution, mini disk formation has also been investigated and have been accounted for variability in accretion rate. Our results also testify that the massive BH detected by LIGO till date was never able to launch a powerful GRB because as per our results such massive BH should not have required high spin to support such event.

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