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Disk formation from the collapse of a rotating neutron star

An unstable rotating neutron star can collapse to a black hole.
A particle in the Innermost Stable Circular Orbit (ISCO) of this black hole has the lowest possible angular momentum that prevents it to fall into the black hole.
Only the particles of the unstable neutron star that have a specific angular momentum greater than that of the black hole ISCO will escape the collapse.
Using this criterion, we estimate the mass of the disk that might form in a neutron star collapse for a variety of Equation Of States (EOSs).
This is achieved by analysing the neutron star equilibrium configurations obtained with the XNS code and by checking our predictions with general relativistic hydrodynamical simulations performed with the BAM code.
We find that for all considered EOSs the disk mass is too low to generate gamma ray bursts with significant energy.

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