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Gravitational Waves through the binary formation in Merging Galaxies

Gravitational Waves through the binary formation in Merging Galaxies
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Gravitational waves: Violent events, such as the collision of two black holes, are thought to be able to create ripples in space-time known as gravitational waves. In 2016, the Laser Interferometer Gravitational-Wave Observatory (LIGO) announced that it found evidence of these tell-tale indicators. By the date, LIGO and LISA have observed 10 events of binary mergers along with the successful detection of Gravitational Waves in each case. With advanced interferometers coming in a row the detection rates will increase significantly and many unknown facts will be known.
Apart from the traditional sources of Gravitational waves like binary black holes, neutron stars including pulsars etc. the possibilities of generation of gravitational waves from supermassive black holes sitting in the heart of galaxies is still considered to be high. As the mergers of SMBH during galaxy collisions is a potential candidate of gravitational waves it also has a big drawback that we need to wait for millions of years for these mergers to take place for direct observation by presently available technology. In this context here we propose the work done in the field of the simulations of mergers and the detection of GWs and its broad scope even apply for any forthcoming merging even to be observed in near future.
GW & Galaxy Mergers: By the advancement of technology we have now been succeeded for direct observations of many galaxy mergers events. This astrophysical event is important in the sense of merger of supermassive black holes as well. Thus these are strong candidates of gravitational waves. I hereby present a detailed correlation between mathematical relativity principles involved in Galaxy mergers and the resulting possible gravitational waves. The study includes the theoretical approach in the mathematical domain of relativity related to heavy masses collisions. A systematic study of gravitational waves from galaxy mergers, through N-body simulations, is studied. In particular, investigation for the relative importance of galaxy components (disk, bulge, and halo) and effects of initial relative velocity, relative angular momentum, and the mass ratio of the galaxies is proposed.

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