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Studies on properties of relativistic diffusive shock acceleration

It is well accepted today that diffusive acceleration in shocks results to the cosmic ray spectrum formation. This is particularly true for non-relativistic shocks as there is a detailed theory covering a large range of their properties. On the other hand, the properties of relativistic and highly relativistic shock waves, associated with supersonic plasma flows, are still under investigation and debate. Here we perform a series of Monte Carlo simulations in order to further study the properties and find possible correlations between the crucial parameters in such types of shocks.

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