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Investigation of Mach cones and the corresponding two-particle correlations in a microscopic transport model

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Using a microscopic transport model we investigate the evolution of conical structures originating from the supersonic jet
through the hot matter and dense matter of ultra-relativistic heavy-ion collisions. We found that the Mach cone angle
is influenced by the source term properties, energy deposition and viscosity. While in a static medium a possible
double-peak structure is overshadowed by the diffusion wake and head shock, it turns out that in central heavy-ion collisions
due to the radial flow of the expanding medium a double-peak structure is visible. On the one hand this is mainly contributed
from Mach cones propagating into the opposite direction of the radial flow, while on the other hand deflected jets may also
contribute to a final double-peak structure. The corresponding double-peak structure is observed insofar the shear viscosity over entropy density ratio is sufficiently small, while a larger dissipation destroys any kind of Mach cone and/or double-peak structure.

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