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Identifying QCD transition using convolution neural network (15'+5')

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The initial state fluctuations in relativistic heavy ion collisions are converted to the final state correlations of soft particles
in momentum space, through strong collective expansion of the quark gluon plasma (QGP) and the QCD transition from
QGP to hadrons. The patterns (equations of state) encoded in the relativistic hydrodynamic evolution are extracted from the final
particle spectra rho(pt, phi) using supervised learning with a deep convolution neural network (DCNN).
Comparisons with traditional machine learning methods (such as support vector machine, decision trees and random forests⋯)
show that the DCNN is very good at decoding physical information from complex and dynamical evolving systems.

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