

# Systematic measurements of light vector mesons at RHIC-PHENIX

Yoshihide Nakamiya<sup>a</sup> for the PHENIX collaboration

<sup>a</sup>Graduate School of Science, Hiroshima University,  
1-3-1 Kagamiyama Higashi-Hiroshima, Hiroshima  
739-8526, Japan, *nakamiya@hepl.hiroshima-u.ac.jp*

Relativistic heavy-ion collisions offer a powerful tool to explore the phase transition between normal nuclear matter and strongly interacting matter governed by partonic degree of freedom. Measurement of light vector mesons such as  $\phi$  and  $\omega$  in heavy-ion collision provides important probes to investigate the property of the partonic matter. The Masses, lifetimes and branching ratios of these mesons are expected to change due to the partial restoration of chiral symmetry in extremely high temperature medium. The PHENIX experiment at RHIC is uniquely suitable for this study because PHENIX has a versatile detector with excellent capabilities to measure electrons and photons as well as hadrons in a wide dynamic range. Systematic studies of multiple decay channels for light vector mesons make it possible to extract important information from the complex physics environment of heavy-ion collision.

We will report the latest results of light vector meson measurements for multiple decay channels ( $\phi \rightarrow e^-e^+$ ,  $K^+K^-$  and  $\omega \rightarrow e^-e^+$ ,  $\pi^0\gamma$ ,  $\pi^0\pi^+\pi^-$ ) in various collision systems from proton+proton to Au+Au collisions over several collision energies up to  $\sqrt{s_{NN}} = 200$  GeV.