Characteristics of Parton Energy Loss Studied with High-p_{T} Particle Spectra from PHENIX

K. Reygers[a] for the **PHENIX Collaboration**

[a]University of Münster,
48149 Münster, Germany, *reygers@ikp.uni-muenster.de*

Parton energy loss is characterized by studying its dependence on energy ($\sqrt{s_{\mathrm{NN}}}$), path length, and on the colliding species. As a starting point the latest results on the suppression of high-p_{T} π^0's (up to $p_{\mathrm{T}} = 20$ GeV/c) in Au+Au at $\sqrt{s_{\mathrm{NN}}} = 200$ GeV will be presented. We extend this by presenting new results on the $\sqrt{s_{\mathrm{NN}}}$ dependence of the hadron suppression from Au+Au at 62.4 GeV, and Cu+Cu at 22.4, 62.4, and 200 GeV. Especially the lower-energy data sets shed light on the interplay between jet suppression and nuclear enhancement ("Cronin effect"). Moreover, the 22.4 GeV data allow a comparison to CERN SPS results. Except for $\sqrt{s_{\mathrm{NN}}} = 22.4$ GeV all p+p reference spectra were measured within PHENIX. Since the energy-loss depends both on the density of the medium and the path-length traveled by the parton, we also measure the suppression as a function of the angle w.r.t. the reaction plane in non-central Au+Au collisions. These results will be confronted with the path length dependence expected in parton energy loss models. Finally, the high-p_{T} hadron spectra are compared to prediction from parton energy loss models in a systematic way in order to extract medium properties such as the initial gluon density $\mathrm{d}N^{\mathrm{g}}/\mathrm{d}y$ and the transport coefficient $\hat{q}$.