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Low Mass Vector Mesons Production in $p + p$ collisions at forward rapidity in the dimuon channel at $\sqrt{s} = 200$ and 510 GeV at RHIC

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Low mass vector mesons (ρ , ω , ϕ) provide important information on the hot and dense state of strongly interacting matter produced in heavy ion collisions. Among them, strangeness enhancement, a phenomenon associated with soft particles in the bulk matter, can be accessed through the measurement of the ratio $\phi/(\rho + \omega)$.

Low mass vector meson production in $p + p$ collisions provides a reference for this study.

In addition, vector meson production in $p + p$ collisions is an important tool to study QCD, providing data to tune soft phenomenological QCD models and to compare to hard pQCD calculations.

The PHENIX experiment at RHIC is capable of studying low-mass vector meson production with two muon spectrometers covering the rapidity range $1.2 < |y| < 2.2$, offering a complementary measurement to the one done at mid-rapidity.

In this poster we report recent PHENIX results on the measurement of differential cross sections, p_T and rapidity

dependencies of $(\rho + \omega)$ and ϕ mesons production in $p + p$ collisions at $\sqrt{s}=200$ GeV based on the data sample collected in 2009.

Since 2012, the forward vertex detector (FVTX) offers an improved dimuon invariant mass resolution.

Latest status of the light vector meson measurements using the data collected in 2013 with FVTX at $\sqrt{s}=510$ GeV will be presented.

On behalf of collaboration:

PHENIX

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