

Detectability of ω meson mass modification with pole dropping and/or broadening scenarios

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The origin of hadron masses cannot be attributed to the Higgs mechanism alone. On top of that, spontaneous breaking of chiral symmetry, potentially restored at extremely high temperatures, should play an important role. Light vector mesons (ρ , ω , ϕ) are highly sensitive to chiral symmetry restoration, so that a modification in their mass is expected. This study evaluates the detectability of ω meson mass modification. A dimuon spectrum from pp collisions at $\sqrt{s} = 13$ TeV collected during Run 2 at ALICE is used for determining the input parameters. There are two mass modification scenarios: mass dropping, consisting in a shift to lighter states, and mass broadening, which has effects on the width of the bound state. In addition to these, a mass “dropping and broadening” scenario is also considered. This feasibility study is focused on the mass modification analysis for light vector mesons exploiting Pb-Pb collisions that will be collected next November during the Run 3 LHC campaign.

Theory / experiment

Experiment

Group or collaboration name

ALICE collaboration

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