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The mass and leptonic decay constant of rho meson at the physical point

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We use overlap valence quarks on the $L^3 \times T = 48^3 \times 96$ $N_f = 2 + 1$ domain-wall fermion configurations generated by the RBC&UKQCD Collaboration. The light sea quark mass is at the physical point and the spatial extension is 5.5 fm. The ρ mass is precisely determined to be $m_\rho = 778(9)$ MeV at the physical pion mass. We also propose a strategy to reduce the noise of the wall-wall correlation functions of hadrons, through which the leptonic decay constant of ρ , f_ρ , is determined to be $209(4)$ MeV at the physical m_π . This value is in excellent agreement with the experimental value $f_\rho = 208$ MeV derived from the process $\tau \rightarrow \rho\nu_\tau$.

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