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Revisiting the Vector Dominance Model in Radiative Vector-Meson Decays[1] MEGAN MATTHEWS, PAUL HOHLER, RALF RAPP, Texas A&M Cyclotron Institute — The application of the vector dominance model (VDM) to the Dalitz decay of the omega meson into dimuons and a neutral pion underestimates the experimental spectra, especially when approaching the kinematic limit. Recently, the discrepancy became more apparent as the NA60 experiment at the CERN-SPS re-measured the omega form factor with better precision. In the present work, we augment the baseline VDM by simulating the finite size of the omega-rho-pi vertex through a hadronic form factor, which has been introduced 14 years ago in a different context. The additional momentum dependence predicted by the form factor improves the description of the NA60 data noticeably. In addition, we have improved the intermediate rho propagator by replacing its schematic width with a microscopic model for its vacuum self-energy. This leads to a further, albeit smaller, improvement in the description of the data. As another test of the form factor, we have checked the decay width of the rho meson into a gamma ray and a pion, which turns out to agree with the experimental value. Our results thus support the use of hadronic form factors to simulate finite-size effects in hadronic interactions and improve on an apparent shortcoming of the VDM.

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