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Precision predictions for B -> rho tau nu and B -> omega tau nu in the SM and beyond

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We present new precision predictions for semitauonic decays involving rho and omega final state mesons. These decay channels offer an interesting orthogonal probe to study the existing B anomalies in semitauonic transitions and are accessible with the Belle II experiment. The predictions are based on combining existing light-cone sum-rule calculations for the form factors with measured experimental spectra from the BaBar and Belle collaborations. This allows us to extrapolate the light-lepton form factor predictions reliably to large values of the four-momentum transfer squared, q2, and in turn to derive precise predictions for R(rho) and R(omega), the ratio of the total decay rates of B -> rho l nu and B -> omega l nu for tau final states with respect to light leptons in the SM. In addition, we investigate the impact of all four-fermi operators on the semitauonic q2 spectra and these ratios.

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