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Exclusive W decay in Effective Field Theory

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We examine exclusive W decays, such as $W^\pm \rightarrow \pi^\pm + \gamma$. The mass of the W boson is predicted by the standard Weinberg-Salam model for weak interactions. Detection of its radiative decay along with the measurement of the photon energy can be used to obtain a precise determination of this mass. So a good theoretical calculation of these rare decay modes is significant and can provide an important test of the standard model. We estimate the branching ratio for these processes in the context of perturbative QCD as well as effective field theories such as soft collinear effective theory (SCET) which would be quite relevant as a playground for understanding these decays which involve the emission of an energetic photon and a meson which is a collinear bound state of the quarks.

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