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Explaining the Cabibbo Angle Anomaly (17+3)

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The first row of the Cabibbo-Cobayashi-Maskawa (CKM) matrix shows a discrepancy of $\sim 3\sigma$ with unitarity, known as the "Cabibbo Angle Anomaly" (CAA). After reviewing the origin and status of the anomaly, I investigate the various possibilities to explain it in the context of physics beyond Standard Model (BSM) which can be broadly grouped into three categories: modifications of four-fermion contact operators, modifications of the leptonic W vertices and modifications of the W vertices with quarks. In addition, I also discuss the phenomenological implications in the electroweak (EW) precision observables and low energy observables testing lepton flavour universality (LFU) which have to be taken into account in order to assess the viability of these solutions. Then, I review concrete realizations of BSM physics proposed to solve the CAA, which highlight the correlation with other existing anomalies such as $b \rightarrow s\ell\ell$ and $\tau \rightarrow \mu\nu\nu$, providing interesting predictions to be tested experimentally in the near future.

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