The inverse amplitude method in $\pi\pi$ scattering in Chiral Perturbation Theory to two loops.

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The inverse amplitude method is used to unitarize the two loop $\pi\pi$ scattering amplitudes of $SU(2)$ chiral perturbation theory in the $I = 0, J = 0$, $I = 1, J = 1$ and $I = 2, J = 0$ channels. An error analysis in terms of the low energy one-loop parameters $\bar{l}_{1,2,3,4,}$ and existing experimental data is undertaken. A comparison to standard resonance saturation values for the two loop coefficients $\bar{b}_{1,2,3,4,5,6}$ is also carried out. Crossing violations are quantified and the convergence of the expansion is discussed.

The conclusions of this work are focused in the impact of the uncertainties of the one-loop and two-loop parameters over the predictive power of IAM in chiral perturbation theory, and on the role played by such issues as chiral zeros and crossing violations in unitarization. For a more detailed description see Ref[1].

References

[1] J. Nieves, M. Pavón Valderrama, E. Ruiz Arriola, Phys.Rev. **D 65** (2002) 036002

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