Unitarized chiral perturbation theory of hadrons

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I) shall report upon recent developments using unitary extensions of chiral perturbation theory. After a brief review of the different methods most often used, the Inverse Amplitude Method, the N/D method and the Bethe Salpeter equation in coupled channels, I shall show the applications to the meson meson interaction, and meson resonances. Then a survey will be made of recent applications in the baryon sector to study the meson baryon interaction and to generate dynamically an octet of $1/2^-$ resonances. Then I shall review applications of this field to nuclear problems like the K^-, η selfenergy in nuclear matter with applications to Kaon atoms and η bound states in nuclei, and ρ and ϕ renormalization in the nuclear medium. Simultaneusly the renormalization of the $\Lambda(1405)$ and $N^*(1535)$ resonances will show up. Finally I shall report on recent developments around the modification of the σ properties in the nuclear medium, and how they can be seen in a recent experiment carried out at Mainz on the photoproduction of two neutral pions in nuclei. A review of these unitary methods and applications to particle and nuclear physics can be seen in the article $\tilde{1}$.

References

1[1] J. A. Oller, E. Oset and A. Ramos, Prog. Part. Nucl. Phys. 45 (2000) 157