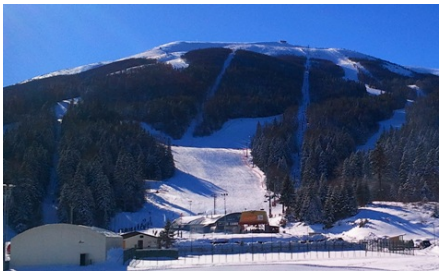

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$a_0(980)$ as a dynamically generated resonance in the extended linear sigma model

Tuesday 4 February 2014 11:30 (30 minutes)

We study basic properties of scalar hadronic resonances within the so-called extended linear sigma model (eLSM), which is an effective model of QCD based on chiral symmetry and dilatation invariance. In particular, we focus on the mass and decay width of the isovector state $a_0(1450)$ and perform a numerical study of the propagator pole(s) on the unphysical Riemann sheets. Here, the $a_0(1450)$ is understood as a seed state explicitly included in the eLSM – this is in fact not true for the corresponding resonance below 1 GeV, the $a_0(980)$, which is sometimes interpreted as a kaonic (i.e., dynamically generated) bound state. In our work we want to clarify if the yet not included $a_0(980)$ can be found as a propagator pole generated by hadronic loop contributions. From such an investigation one could learn more about the general dependence of the eLSM – and effective field models in general – on strongly coupled hadronic intermediate states, possibly giving new insight into the low-energy regime, scalar resonances and both its theoretical description and physical interpretation.

Primary author: WOLKANOWSKI, Thomas (Johann Wolfgang Goethe-Universität)

Presenter: WOLKANOWSKI, Thomas (Johann Wolfgang Goethe-Universität)