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Thermal hadron resonances and Ward Identities: results for the QCD phase diagram

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I will present relevant results for the QCD phase diagram, within a combined framework of Ward Identities (WI) and Unitarized Effective Theories. On the one hand, WI provide model-independent results for susceptibilities with direct consequences on the relation between chiral and $U(1)_A$ restoration, key to understand the nature of the transition. Those WI also allow to derive scaling laws around T_c which can be checked with lattice screening masses. On the other hand, thermal resonances $f_0(500)$ and $K_0^*(700)$, generated within Unitarized Chiral Perturbation Theory $\pi\pi$ and $K\pi$ scattering at finite temperature,
play a key role regarding chiral and $U(1)_A$ restoration, through saturated scalar susceptibilities in those channels. Novel results for effective theories at nonzero isospin density and nonzero chiral imbalance would also be discussed.

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