Phenomenology of light mesons within a chiral approach

Francesco Giacosa[(a)], Denis Parganlija[(a)], Susanna Gallas[(a)], Dirk H. Rischke[(a)], Anja Habersetzer[(a)], Peter Kovacs[(b)], Giorgy Wolf[(b)]

[(a)] Institute of theoretical Physics, Max-von-Laue Str. 1, JW Goethe University, Frankfurt am main, Germany
[(b)] Research Institute for Particle and Nuclear Physics, H–1525 Budapest, POB 49, Hungary

The phenomenology of mesons below 1.8 GeV is investigated within a chiral approach which includes (pseudo)scalar and (axial-)vector degrees of freedom [1,2]. It is shown that the inclusion of (axial-)vector degrees of freedom represents a crucial step which significantly affects the results of decay widths and scattering lengths. Particular attention is devoted to scalar mesons, including the scalar glueball and its mixing with quark-antiquark fields. The phenomenological properties of a putative pseudoscalar glueball with a lattice predicted mass of about 2.6 GeV are also presented.

[1] Denis Parganlija, Francesco Giacosa, Dirk H. Rischke, Phys.Rev. D82 (2010) 054024; Stanislaus Janowski, Denis Parganlija, Francesco Giacosa, Dirk H. Rischke, Phys.Rev. D84 (2011) 054007; Susanna Gallas, Francesco Giacosa, Dirk H. Rischke, Phys.Rev. D82 (2010) 01400.

[2] Denis Parganlija, Francesco Giacosa, Dirk H. Rischke, Peter Kovacs, Gyorgy Wolf , Int.J.Mod.Phys. A26 (2011) 607-609, Denis Parganlija, Francesco Giacosa, Peter Kovacs, Gyorgy Wolf , AIP Conf.Proc. 1343 (2011) 328-330; P. Kovacs, G. Wolf, F. Giacosa, Denis Parganlija, EPJ Web Conf. 13 (2011) 02006.

E-mail: giacosa@th.physik.uni-frankfurt.de