



# Recent results on low-mass dielectron production in pp and Pb--Pb collisions with ALICE



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 500-1-001 - Main Auditorium (CERN)

**Description** Low-mass  $e^+e^-$  pairs are a particularly useful probe to study the hot and dense medium created in ultra-relativistic heavy-ion collisions. Such pairs are produced during all stages of the collision and carry information about the whole space-time evolution of the system, unperturbed by strong final-state interactions.

The invariant-mass ( $m_{ee}$ ) continuum of dielectrons is extremely rich in physics sources: on top of Dalitz and resonance decays of pseudoscalar and vector mesons, heavy-flavour hadron decays and thermal radiation from the medium contribute to the dielectron continuum. In particular the production of thermal radiation and the possible modification of the spectral function of the short-lived rho meson, decaying into dielectrons, are of great interest. The latter is an especially well suited probe of chiral symmetry restoration, which is predicted to be restored at the high temperatures reached in ultra-relativistic heavy-ion collisions. In the intermediate-mass region, the early temperature of the system can be extracted from the  $m_{ee}$ -spectrum of its thermal black-body radiation. However, it is first necessary to understand the very large background of correlated dielectron pairs from semi-leptonic charm and beauty hadron decays.

The measurement of dielectron production in inelastic proton--proton collisions serves as crucial vacuum reference needed for the heavy-ion studies. In particular, the intermediate-mass region provides insight into heavy-flavour production complementary to single heavy-flavour hadron measurements. Recently, proton--proton collisions with high charged particle multiplicities have been found to exhibit phenomena similar to those attributed to the quark--gluon plasma formation in heavy-ion collisions. Dielectron measurements may contribute to a better understanding of the underlying physics processes in such collisions.

We present the latest results on low-mass dielectron production from the ALICE Collaboration in pp collisions at  $\sqrt{s} = 7$  TeV and 13 TeV and in central Pb--Pb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV. The implications for heavy-flavour and (thermal) direct photon production will be discussed. Furthermore, the results in pp collisions at  $\sqrt{s} = 13$  TeV will be shown as a function of the charged-particle event multiplicity. Finally, perspectives for the LHC Run-3 will be shortly mentioned.

Organized by M. Mangano, M. Pepe-Altarelli, G. Unal..... Refreshments will be served at 10h30