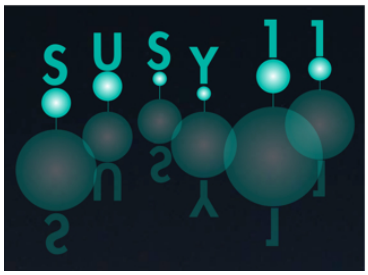

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Muon g-2 and \alpha(M_Z^2) re-evaluated using new precise data

Thursday, 1 September 2011 14:30 (30 minutes)

We update our Standard Model predictions for g-2 of the muon and for the hadronic contributions to the running of the QED coupling, \Delta\alpha^{(5)}*{had}(M_Z^2). Particular emphasis is put on recent changes in the hadronic contributions from new data in the 2\pi channel and from the energy region just below 2 GeV. In particular, for the e^+e^- \to \pi^+\pi^- contribution we include the recent 'radiative return' data from KLOE and BaBar. We also include the recent BaBar data on other exclusive channels. We make a detailed study of the effect of replacing the measurements of the inclusive cross section, \sigma(e^+e^- \to hadrons), by the sum of the exclusive channels in the energy interval 1.43 < \sqrt{s} < 2 GeV, which includes a QCD sum-rule analysis of this energy region. Our favoured prediction for the muon anomalous magnetic moment is (g-2)/2 = (11659182.8 \pm 4.9) \times 10^{-10} which is 3.3 \sigma below the present world-average measurement. We compare our g-2 value with other recent calculations. Our prediction for the QED coupling, obtained via \Delta\alpha*{had}^{(5)}(M_Z^2) = (276.26 \pm 1.38) \times 10^{-4} is \alpha(M_Z^2)^{-1} = 128.944 \pm 0.019.

Presenter: Dr NOMURA, Daisuke (Tohoku University)

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