## Portoroz 2015: Particle Phenomenology From the Early Universe to High Energy Colliders



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## "Hadronic Effects and Observables in $B \to \pi \ell^+ \ell^-$ decay"

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I will present new results on the theory of the rare flavour-changing neutral-current decay  $B \to \pi \ell^+ \ell^-$  in the region of large recoil of the pion. Nonlocal hadronic effects in this decay are treated in a systematic way, combining QCD calculation with hadronic dispersion relation including the vector meson contributions. The effective addition to the Wilson coefficient  $C_9$  is calculated in the region  $0 \le q^2 \le m_{J/\psi}^2$  of the leptonpair invariant mass. This result, together with the updated  $B \to \pi$  form factor from light-cone sum rules, is used to predict the rate, CP-asymmetry and isospin-asymmetry in  $B \to \pi \ell^+ \ell^-$  in the Standard Model. The influence of hypothetical new physics in  $b \to d\ell^+ \ell^-$  transitions on these observables, as well as the expectations for similar exclusive FCNC decays will be also discussed.

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