

## New physics sensitivity of the rare decay mode

$$B \rightarrow K^0 \ell^- e \ell^+$$

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We design new observables available from the angular distributions of the decay

$B \rightarrow K^0 e \ell^- e \ell^+$  with high sensitivity to specific new physics operators.

We present a NLO analysis of all observables based on the QCD factorization approach in the low-dilepton mass region and make the uncertainties due to the  $\Lambda/m_b$  corrections manifest and finally analyse the sensitivity of the new observables to new physics.

We explore the experimental sensitivities at LHCb and SuperLHCb based on a full-angular fit method. We also show that the previously discussed transversity amplitude  $AT_1$  cannot be measured at the LHCb experiment or at future  $B$  factory experiments as it requires a measurement of the spin of the final state particles.

We also analyse CP violating observables in this decay mode and critically discuss their sensitivity to new physics.

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