Problem statement. Calibration of the magnetic field by the horizontal precession frequency. Simulation results.

Rotational magnet misalignments cause a faking MDM precession in the vertical plane (see section **??**), which, in the method considered in this work, is dealt with by injecting the beam consecutively in opposite directions and constructing the EDM effect estimator as a sum of the CW and CCW vertical plane precession frequencies (see section **??**, eq (**??**)).

Since the precession frequencies are determined by spin tune and the invariant spin axis via $(\Omega_x, \Omega_y, \Omega_z) = 2\pi \cdot f_{rev} \cdot \nu_s \cdot \bar{n}$, it is sufficient to equalize the γ_{eff} of the CW and CCW beams in order to ensure the same faking MDM magnitude. This is because: *a*) the reference orbit spin precession axis preserves orientation and changes sign from $\bar{n} \mapsto -\bar{n}$ when $\boldsymbol{B} \mapsto -\boldsymbol{B}$; *b*) spin tune ν_s is completely determined by γ_{eff} (see section **??**).

The calibration of γ_{eff} is done directly via the equalization of the horizontal spin precession frequencies. In the initial state, $\Omega_x \gg \Omega_y, \Omega_z$, and $\bar{n} \approx \hat{x}$. By means of a WIEN FILTER, the radial precession is first suppressed. Horizontal precession then becomes dominant, i.e., $\bar{n} \approx \hat{y}$. After the reversion of the guide field polarity, the FS condition is again fulfilled. Since the element tilts remain constant during this time, when the WIEN FILTER is turned off again, $\bar{n} \approx -\hat{x}$.