

# Determining the betatron phase measurement precision of the AC dipole method

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## Background

- For head-on beam-beam compensation (e-lens), the phase advance between IP8 and IP10 has to be corrected to  $k \cdot 180^\circ$
- The accuracy of that correction has to be around  $\pm 5^\circ$
- To achieve this accuracy, we have to be able to measure the phase advance to the same precision

## Experiment

- Using the AC dipole, measure the phase advance over one arc
- Change the tune by  $\Delta Q = 0.1$ , or  $36^\circ$
- This tune change corresponds to a betatron phase advance shift of  $6^\circ$  per arc
- Measure the phase advance over the same arc again to verify the change
- Time estimate: 2 hours