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A numerical alignment error estimation for the SPring-8-II

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Trends of accelerator components coordinates on the storage ring, which are designed as the SPring-8-II, are calculated with ground deformation growth rates. The rates are evaluated based on survey data measured since 1996 for the existing SPring-8 accelerator components.

Next, alignment errors for all neighboring two magnet-girders are numerically estimated as relative error ellipses via a surveying network analysis assuming our current measurement schemes and confirmed to be settled within a tolerance, which is designed by our beam optics group.

Levels of the storage ring components are known to be displacing ~2.5 mm for almost 20 years clearly depending on underground components such as underpasses, RF wave-guides, tunnels and cutting or banking structures. A necessity of the realignment for the upgrade configuration are estimated.

In addition, a verification of the ATL-law application via a classical approach for variances of the storage ring level is briefly introduced and discussed.

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