

## 4 Appendices with relevant test data as measured during commissioning at SLAC

- 1- Axial offset forces
- 2- Cool-down
- 3- Fast dump from 4600 A (Current and Coil Voltages decay)

### AXIAL OFFSET FORCE AND DISPLACEMENT

The figure shows the backward end tie rod axial forces as calculated from the measured strain.

Forces on each tie rod and total force (sum of the three) are shown. The total force, which is a maximum of 8 ton at 3800 A, is directed forward. The three forward end tie rod have no strain.

Force behavior vs current is in agreement with an axial displacement of 33 mm in the forward direction of the coil with respect to the iron, as calculated using ANSYS. When positioning the coil, the goal was to set the displacement to 30 mm in order to have the maximum force at 2500 A and only a few tons at full current.

The offset force is not equally shared by the three tie rods.

The average strain in the three tie rods is 500  $\mu\epsilon$ , corresponding to 0.3 mm displacement. The displacement measured with mechanical probes gave 1 mm axial displacement. This discrepancy is most likely due to compression of the spring washers on the tie rods and not as a result of tie rod stress.

