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Alignment of the Silicon Detectors of the ATLAS Experiment
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The ATLAS Experiment is one of the four large detectors located at the Large Hadron Collider at CERN in Geneva, Switzerland. Data taking of ATLAS is expected to start in autumn 2007. The reconstruction of charged particle tracks is performed by silicon and drift tube based sub-detectors. In order to achieve the ATLAS physics goals the intrinsic resolution of the precision tracking devices should not be degenerated by more than 20% due to misalignment. Thus, the positions of the silicon detector elements have to be known to an accuracy of about 10 micrometers. This precision can be achieved by track based alignment algorithms combined with measurements from hardware based alignment techniques. The alignment strategy and the proposed alignment algorithms for the ATLAS Inner Detector as well as their implementations into the common ATLAS software framework are presented. Results from a test-beam setup, from cosmic ray data as well as from full detector simulation studies are shown and discussed.

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