

## INSTALLATION OF HAPPEX DETECTORS

- 1/ Prepare the configuration of the detector package (Jack Segal). Remove s1 plane, rich detector, change position of Cerenkov detector...
- 2/ Bring all the frame + rail mechanics on the spectrometer platform (Jack Segal). Check these mechanics are for right arm.
- 3/ Mount the black corners on the 45 degrees beams, on both sides of the focal plane.
- 4/ Mark the projection of the points used for alignment on the aluminium covers. The positions of these points are quoted on Alan's drawings with respect to the little vertical rods around the VDC plane.
- 5/ Install the rails of the HAPPEX frame which are // to dispersive axis (long black painted rails). Check that the elevation of the top plane of these rails is 15" above the main girders of the detector package. Check the two rails are horizontal.
- 6/ Install the rails of the HAPPEX frame which are // to transverse axis. Check position along dispersive axis (Alan's drawings). Check the rails are horizontal.
- 7/ Install the two tilted rails using quoted distances on the drawings. One end is on contact with the transverse aluminium rails. The height of the other end is adjusted so that the tilted rails are horizontal.
- 8/ Install the detector rail with the thrust square on it. Height is set by the aluminium spacers blocks. Check the rail is horizontal.
- 9/ Align the rail in horizontal plane using plumb ball and marks in the focal plane. Freeze the position.
- 10/ Bring the second detector rail close to nominal position.
- 11/ Put the detector on its rails using transverse girder on top the black corners. Slide it with the bearings on contact with the side plate of the first rail. Bring the second detector rail on contact with the opposite bearings. Freeze position of the second detector rail.
- 12/ Slide the detector along the rails until it is in full lock against the thrust square.
- 13/ Check the alignment of the second detector rail. Check position of the centre of the detector.
- 14/ Mark projections of few points of the detector itself in order to check final position when all the mechanics of the cradle + rail are removed.
- 15/ Set position of the aluminium girders on top of the black corners so that the rods holding the detector are vertical.

- 16/** Tight the vertical rods.
- 17/** Install the 3 horizontal rods to freeze the position.
- 18/** Remove the rails
- 19/** Remove the cradle.
- 20/** Check final position of the detector.