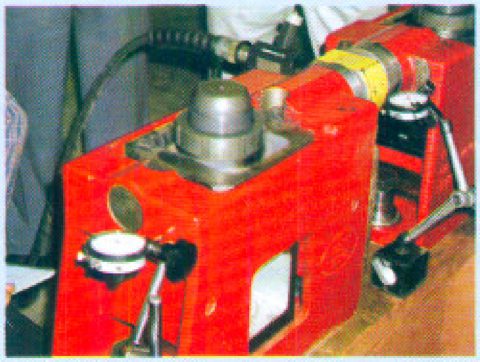

Fig.A.7.2 Two jacks under transverse load test

Three jacks in a tripod configuration with proper layout are used under one magnet, which yield the required freedom as well as control for the alignment. A total of 6800 numbers of these devices are being made in Indian industry and being supplied to CERN under this agreement.

More than 2400 jacks have been shipped to CERN, after successful manufacture and testing from Indo-German Tool Room, Indore and Avasarala Automation Limited, Bangalore. All 6800 PMPS jacks will be supplied by the mid of 2005.

(Contributed by: Jishnu Dwivedi; jishnu@cat.ernet.in)

A.8 Compound motion precision jacks for Indus-2

The Indus-2 jacks have been designed with in built vertical screw, which is an extension of LHC jack system of CERN, for supporting and alignment of 12MT dipole magnets and the common girders of quadrupole and sextupole magnets. The combined motion of three jacks provides the required degrees of freedom for alignment of the magnets and the common girders. The magnets will be placed within 0.1mm in the linear axes and 0.1mrads in the rotational axes with respect to its true position in the Indus-2 ring, using these jacks. These jacks have already been tested under actual dipole magnets and the common girders supporting QP/SP magnets and meet the alignment requirements. Total 120 units of these jacks will be required for alignment of Indus-2 ring of which 30 units have been made ready for installation in the ring. The manufacture of balance quantity of the jacks is in progress.

Fig. A.8.1 Compound motion precision jack for Indus-2

(Contributed by: K. Sreeramulu; sreeram@cat.ernet.in)

A.9 High-resolution powder diffraction beamline design on Indus-2

A high- resolution powder diffraction beamline on Indus-2 is being constructed. Detailed designs of the beamline as well as the experimental station have been done. The beamline has been designed primarily for 5T superconducting wavelength shifter (WLS) source. Care has been taken in the design that the beamline could be installed on a bending magnet source without any alteration in the beamline hardware, in the first phase when the WLS source is not available. Depending upon the requirements of the planned experiments, the beamline can be operated in high flux, high-energy resolution, moderate angular resolution (Mode A) or moderate flux, high-energy resolution, moderate angular resolution (Mode C) modes. Also, high angular resolution mode (mode B) can be selected. At 10keV we get an energy resolution ($E/\Delta E$) of 12,000 (mode A), 17,000 (mode B) and 1000 (mode C). The corresponding flux (Photons/s/0.1mA/0.02%bw), are 3×10^9 (mode A), 3×10^9 (mode B) and 4×10^9 (mode C). The beam sizes are $0.7 \times 0.2\ mm^2$ (mode A), $0.7 \times 0.8\ mm^2$ (mode B) and $0.7 \times 0.2\ mm^2$ (mode C). The beam sizes are independent of photon energy. It is possible to operate the beamline in so many modes because we have opted for bendable pre and post mirrors. A double crystal monochromator with 3:1 sagitally focusing second crystal, have been used as the dispersing element. The optical lay out of the beamline has been shown in fig. A.9.1. Performance of the beamline (in the photon energy range of 5-25keV) in all the above modes of operation for WLS as well as bending magnet sources have been calculated using ray tracing program 'Ray'. Thermal deformations due to heat loads on the optical elements (pre-mirror and the first crystal of the double crystal monochromator) have been taken into account, as calculated using finite element software 'Ansys'. Fig. A.9.2 shows the ray tracing result for 10keV photons for mode A.

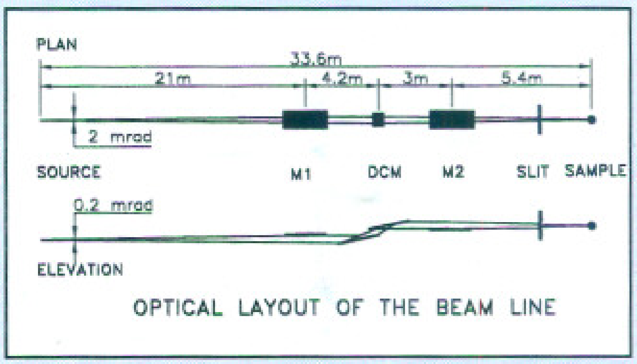

Fig. A.9.1 Optical layout of the beamline, showing plan and elevation