First Virgo MC mirror geometrical specs sheet

VIR-SPE-OCA-4100-143

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Date : 27/01/2003

Update 14/03/03

This document gives the geometrical specs of the MC mirror for the operations of Roma and Perugia in the mounting, positioning and suspending the mirror inside the MC tower.

1. The MC mirror sizes (Figure 1)

Mirror size: diameter 80 +/- 0.1 mm x thickness 31.3 +/-0.1 mm; weight **345 g** (density 2.2), cf doc VIR-SPE-LYO-4340-021.
Coating size on both faces : diameter 70 mm
Beam size centered : diameter 55 mm for diffraction losses of 2.5 ppm.

2. Position inside the tower (Figure 2)

Concerning the position of the mirror with respect to the marionetta: the distance between the lower surface of the old marionetta to the optical axis of the mirror is **510mm+/-5mm**.

3. Position of local control markers-actuators (Figure 3)

- 4 Magnets-coils on V and H axes on back face towards west. Magnet centres are on a circle with radius 37.5 mm around the mirror centre. The horizontal magnets have opposite polarity with respect to the vertical ones, in order to have a vanishing overall dipole moment, thereby reducing the sensitivity to external magnetic fields.
- 4 Markers at 45° of V–H axes and centre of marker at 30 mm of mirror centre on back face.
The box used for gluing magnets and markers on the mirror is designed and realized by Perugia, cf VIR-TRE-PER-4700-108.

4. Orientation of the mirror in its plane (Figure 4)

After coating and characterization in Lyon (cf VIR-SPE-LYO-4340-0024), calculations have been performed by J.Y.Vinet to determine the orientation for the minimum back-scattered light (cf VIR-SPE-OCA-4100-144). The summary of the result is shown on the figure 4 showing that the arrow etched on the mirror is **180° + 23° 35' ± 1°** away from the vertical axis Y.

Figure 1 : Schematic of the Mode Cleaner mirror, its geometry , size of coatings and beam aperture. Mirror weight 345 g.

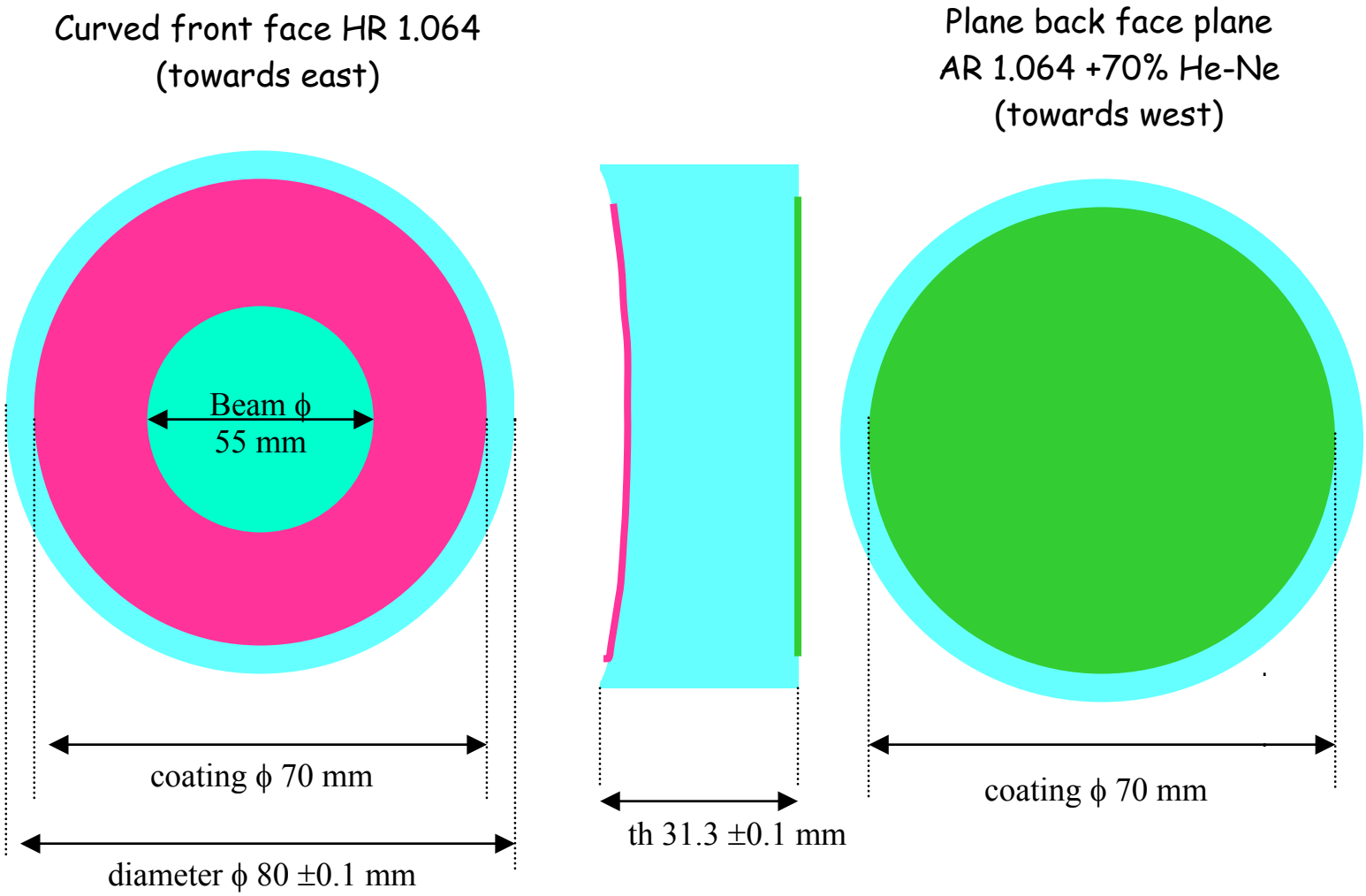

Figure 2 : Distance of the mirror centre to the bottom plane of the old marionette : 510 ± 5 mm.

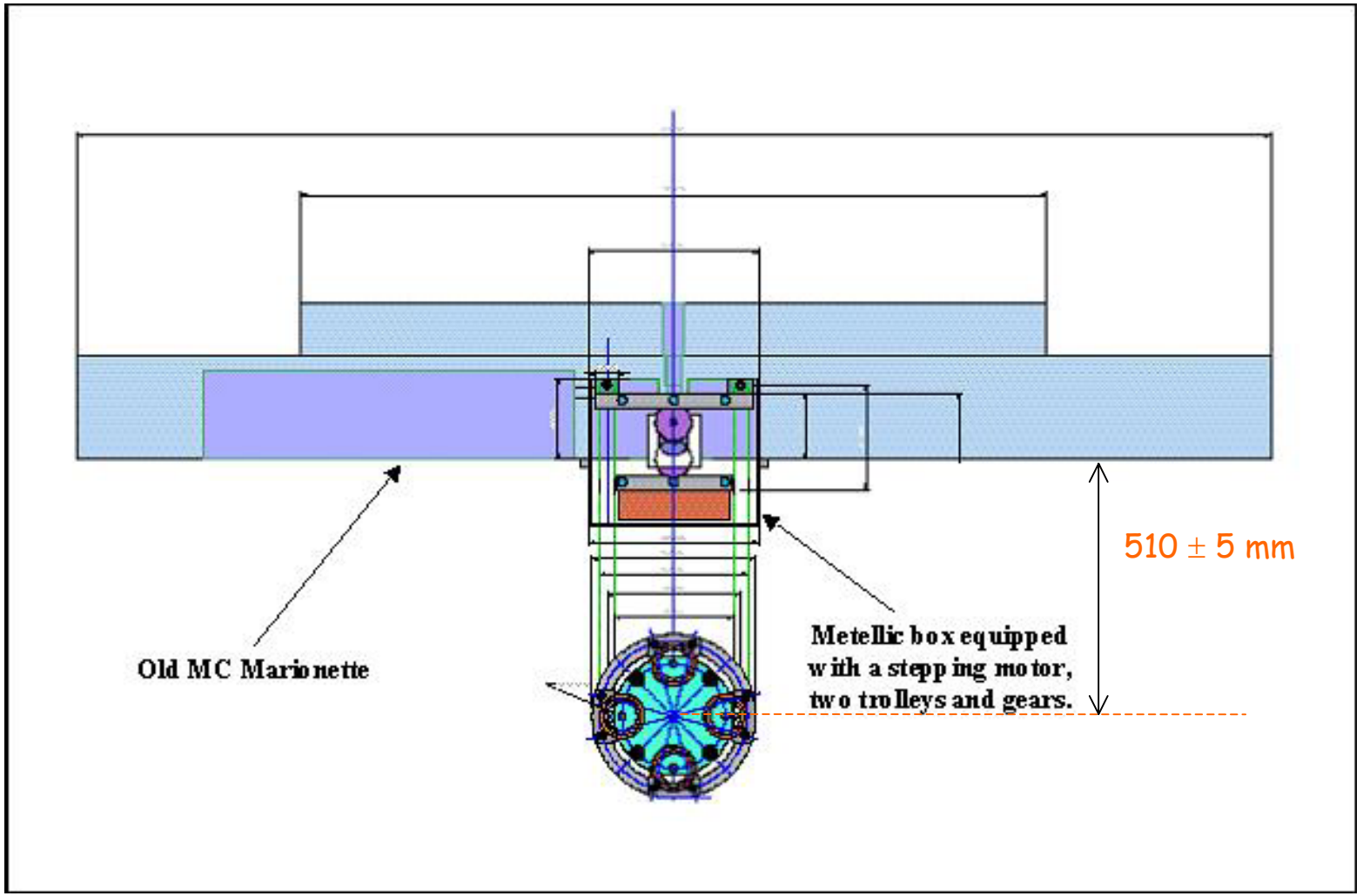

Figure 3 : Position of the markers (45° of V-H) , the magnets (on V-H) on the back face of the mirror (towards West).

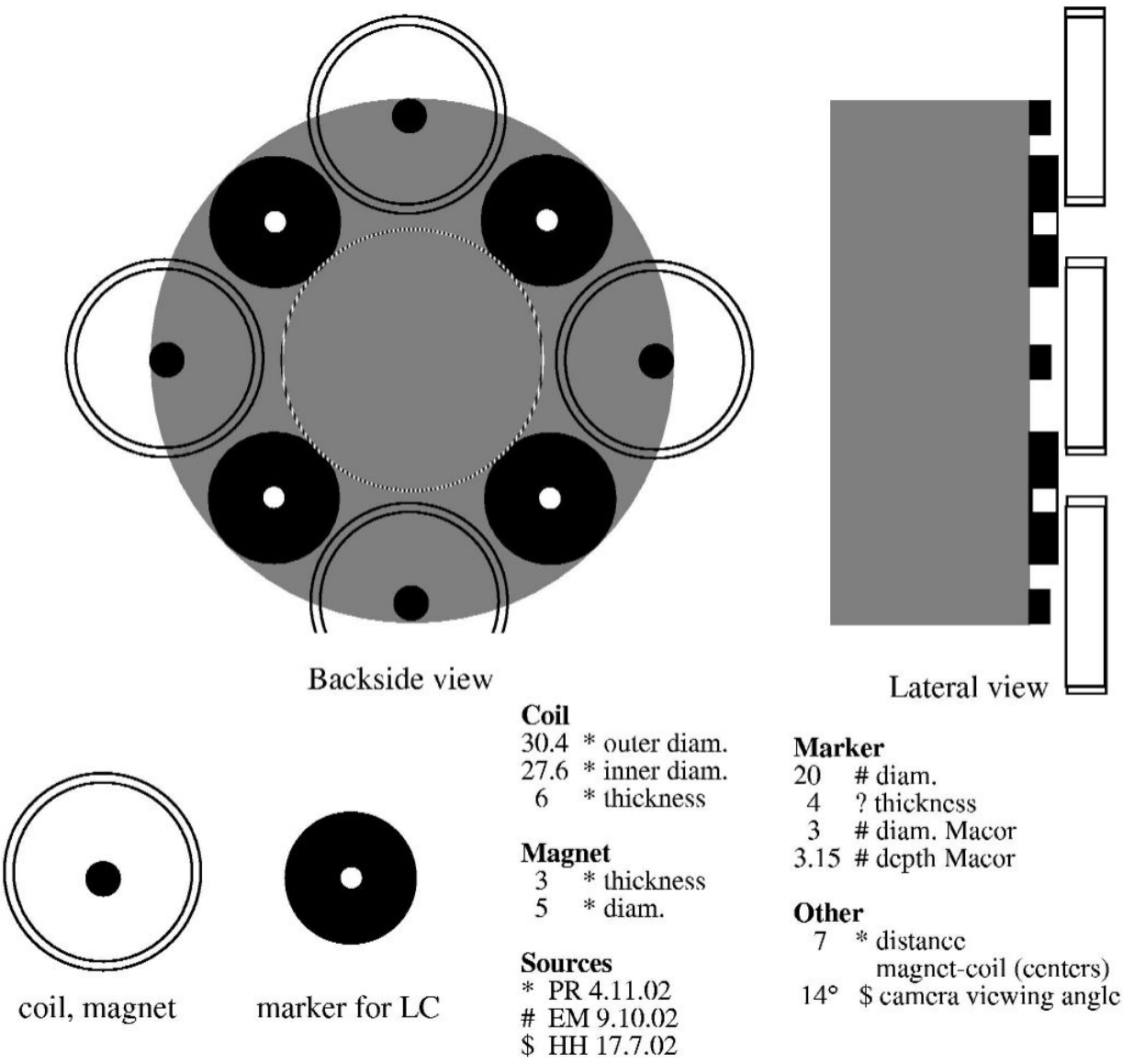

Figure 4 : The arrow is etched on the edge of the substrate and shows the curved face.

Correct orientation of the Mirror , when looking at the curved face.