



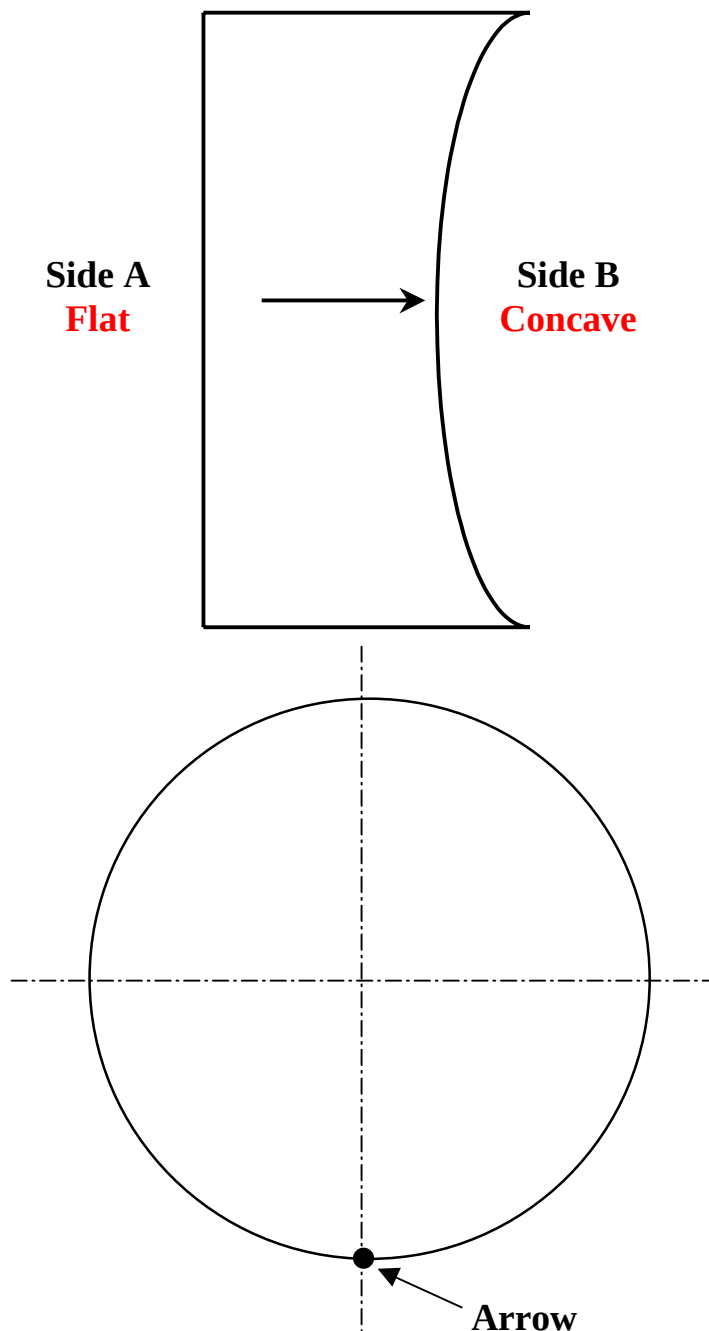
# **VIRGO Mode Cleaner Concave Mirror Characterization**

**Reference : C03004 + C03006**

**VIR-SPE-LYO-4340-0024**

**Issue :1**

# Concave Mode Cleaner Mirror Substrate Drawings



## Signification of the ARROW etched on the edge of the substrate:

- It shows SIDE B

## Nota :

The arrow on the substrates is always at the bottom of the mappings (wavefront, scattering, absorption).

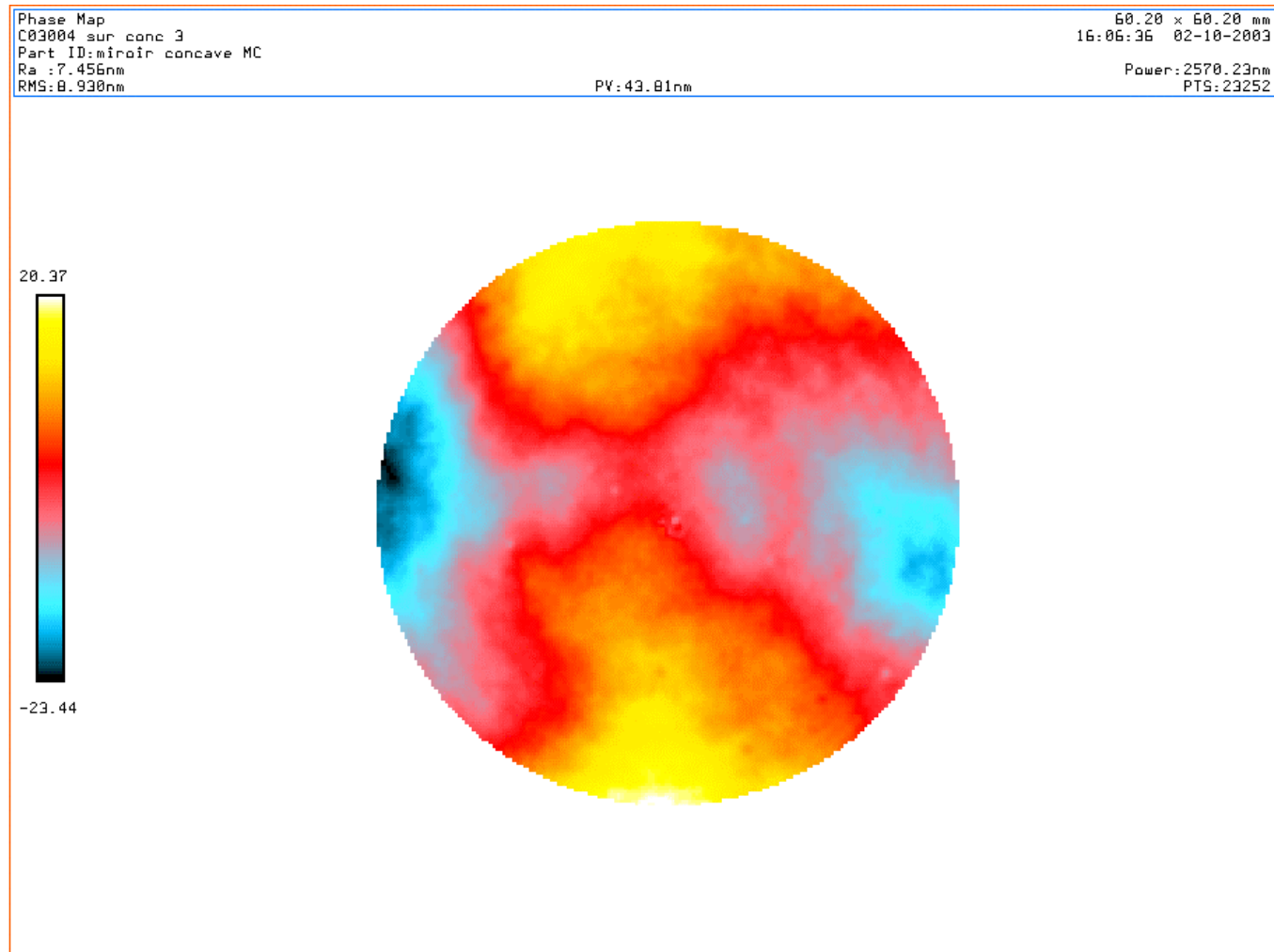
## Serial Number: **C03004 + C03006**

|                                                         |               | <b>VIRGO<br/>Requirements</b>             | <b>SMA-VIRGO<br/>Measurements</b>                                             |
|---------------------------------------------------------|---------------|-------------------------------------------|-------------------------------------------------------------------------------|
| <b>Outside Diameter (mm)</b>                            |               | <b>80 +/- 0,5</b>                         | <b>80,0 +/- 0,1</b>                                                           |
| <b>Thickness (mm)</b>                                   |               | <b>30 +/- 0,5</b>                         | <b>31,3 +/- 0,1</b>                                                           |
| <b>Coating<br/>Nature</b>                               | <b>Side A</b> | <b>x</b>                                  | <b>Antireflective Coating @1064 nm<br/>Mirror @633 nm (R=70 %)<br/>Ø75 mm</b> |
|                                                         | <b>Side B</b> | <b>x</b>                                  | <b>High Reflectivity Coating<br/>Ø75 mm</b>                                   |
| <b>Flatness<br/>R.M.S.</b>                              | <b>Side A</b> | <b>x</b>                                  | <b>8,3 nm Ø60 mm<br/>5 nm Ø22 mm</b>                                          |
|                                                         | <b>Side B</b> | <b>≤ 25 nm Ø60 mm<br/>≤ 2,5 nm Ø22 mm</b> | <b>8,8 nm Ø60 mm<br/>3,4 nm Ø22 mm</b>                                        |
| <b>Radius of Curvature (m)<br/>Side B</b>               |               | <b>-178 &lt; R &lt; -187 m</b>            | <b>-180,7 +/- 2 m Ø60 mm<br/>-181,6 +/- 2 m Ø22 mm</b>                        |
| <b>Average Scattering<br/>(3° incidence)<br/>Side B</b> |               | <b>&lt; 50 ppm</b>                        | <b>65 ppm Ø 60mm<br/>38 ppm Ø 22mm</b>                                        |
| <b>Absorption HR<br/>Side B</b>                         |               | <b>&lt; 5 ppm</b>                         | <b>1,2 ppm<br/>(center)</b>                                                   |
| <b>Transmission<br/>(1° incidence)</b>                  |               | <b>T &lt; 50 ppm</b>                      | <b>5,7 ppm Ø 60mm</b>                                                         |

### Comments:

- The scattering value comes from the poor quality of the substrate surface before coating (high roughness, some large defects).

## Wavefront Side B (Ø60 mm)



|                            |                                    |                           |
|----------------------------|------------------------------------|---------------------------|
| Title: C03004 sur conc 3   | SMA-VIRGO                          | DATE: 02-10-2003 16:06:36 |
| Part ID: miroir concave MC | ADE/PHASE SHIFT                    | Wedge: Surface            |
| Customer: VIRGO            | OptiCode - Phase Analysis Software | Polarity: +               |
| Operator: Laurent Pinard   | Version 4.23 (c) 1995-2000         |                           |
| Terms Subtracted: Tilt     |                                    |                           |

# Transmission in ppm (Ø60 mm)

Service des Matériaux Avancés - I.P.N. Lyon - Villeurbanne - France  
TC03004B.10R

Wavelength  
= 1.0640  $\mu\text{m}$

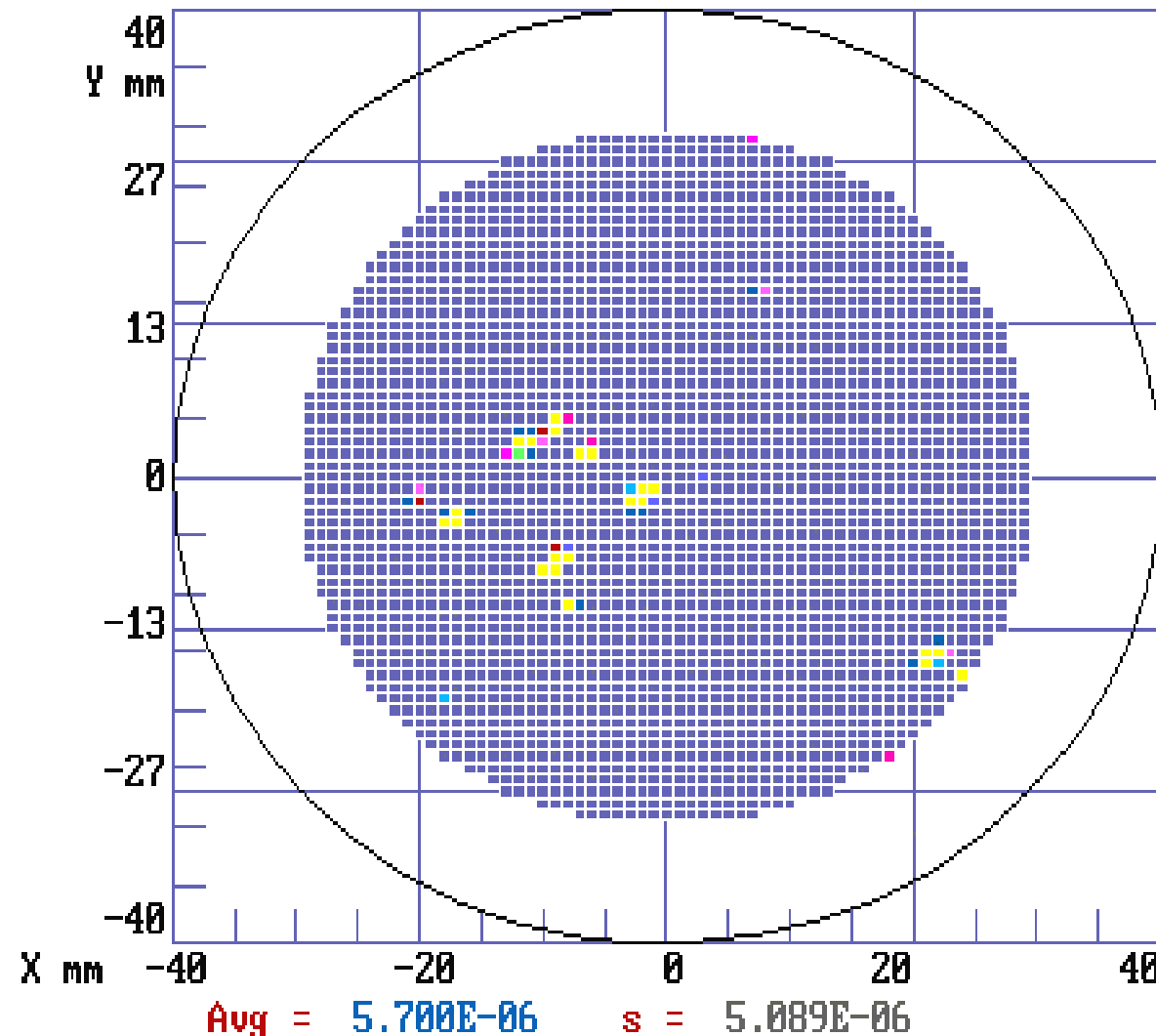
Reflectance  
R = 0.5E-05

Angles:  
 $\theta_i = 1.00^\circ$   
 $\theta_s = 1.00^\circ$   
 $\alpha = 0.00^\circ$

Spot Dia., mm  
= 1.000

Step Size, mm  
= 1.000

Scan Ctr., mm  
X = 0.000  
Y = 0.000



Ref 1  
LINEAR  
8.000E-06  
7.739E-06  
7.477E-06  
7.216E-06  
6.955E-06  
6.693E-06  
6.432E-06  
6.171E-06  
5.909E-06  
5.648E-06  
5.387E-06  
Sub Scale

# Average Scattering Side B (Ø60 mm)

Service des Matériaux Avancés - I.P.N. Lyon - Villeurbanne - France

C03004R.10R

Wavelength  
= 1.0640  $\mu\text{m}$

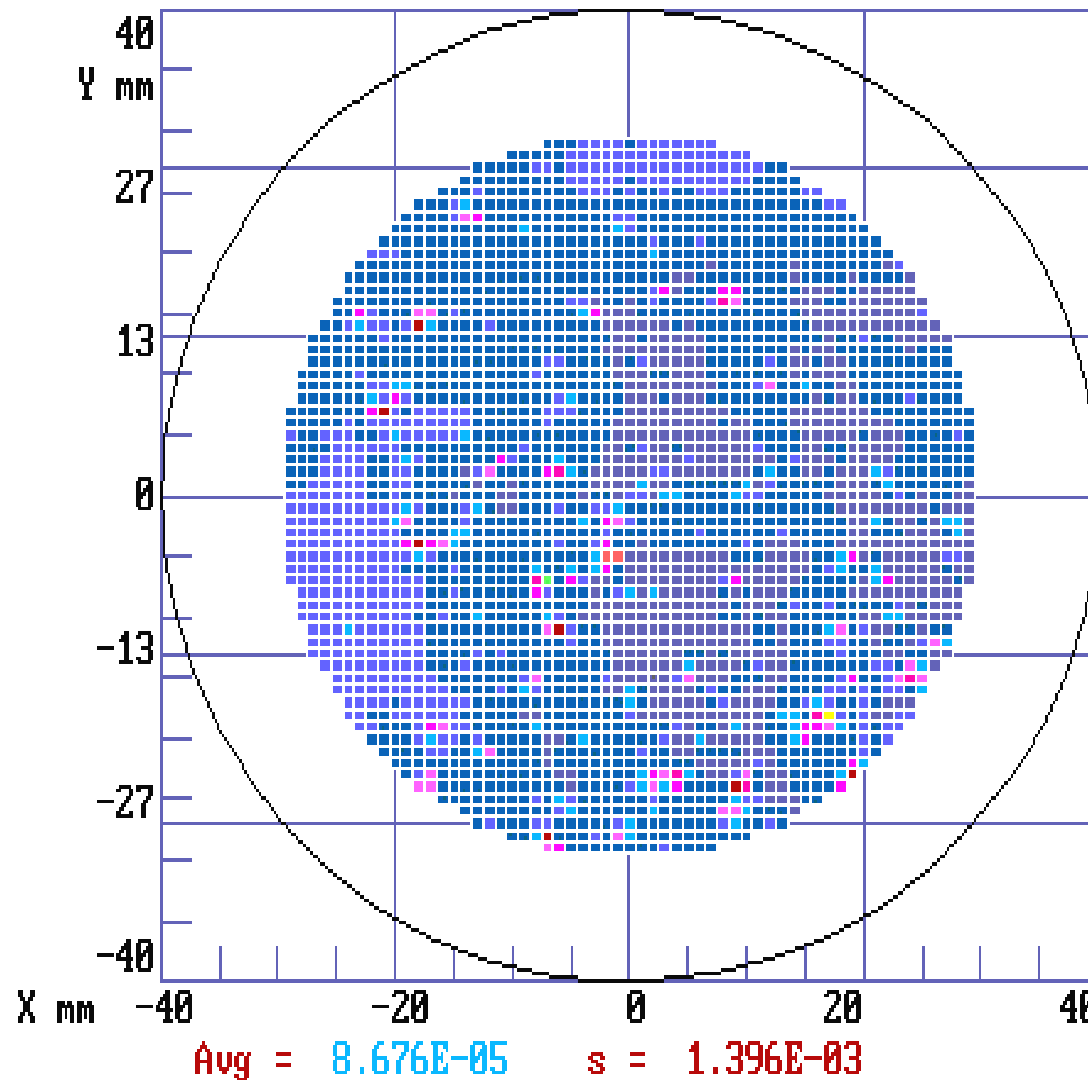
Reflectance  
R = 1.0078

Angles:  
 $\theta_i = 3.00^\circ$   
 $\theta_s = 13.00^\circ$   
 $\alpha = 0.00^\circ$

Spot Dia., mm  
= 1.000

Step Size, mm  
= 1.000

Scan Ctr., mm  
X = 0.000  
Y = 0.000



## Transmission Spectrum

