

GSD [m]  
 vs.  
 Application

1000

Meteorology

Resources Monitoring

100

Hydrology

Environmental Monitoring

10

Agriculture

Forestry

Topography

**STREEGO**

Urban Development

1

Traffic

Defense

0.1

### System Specifications

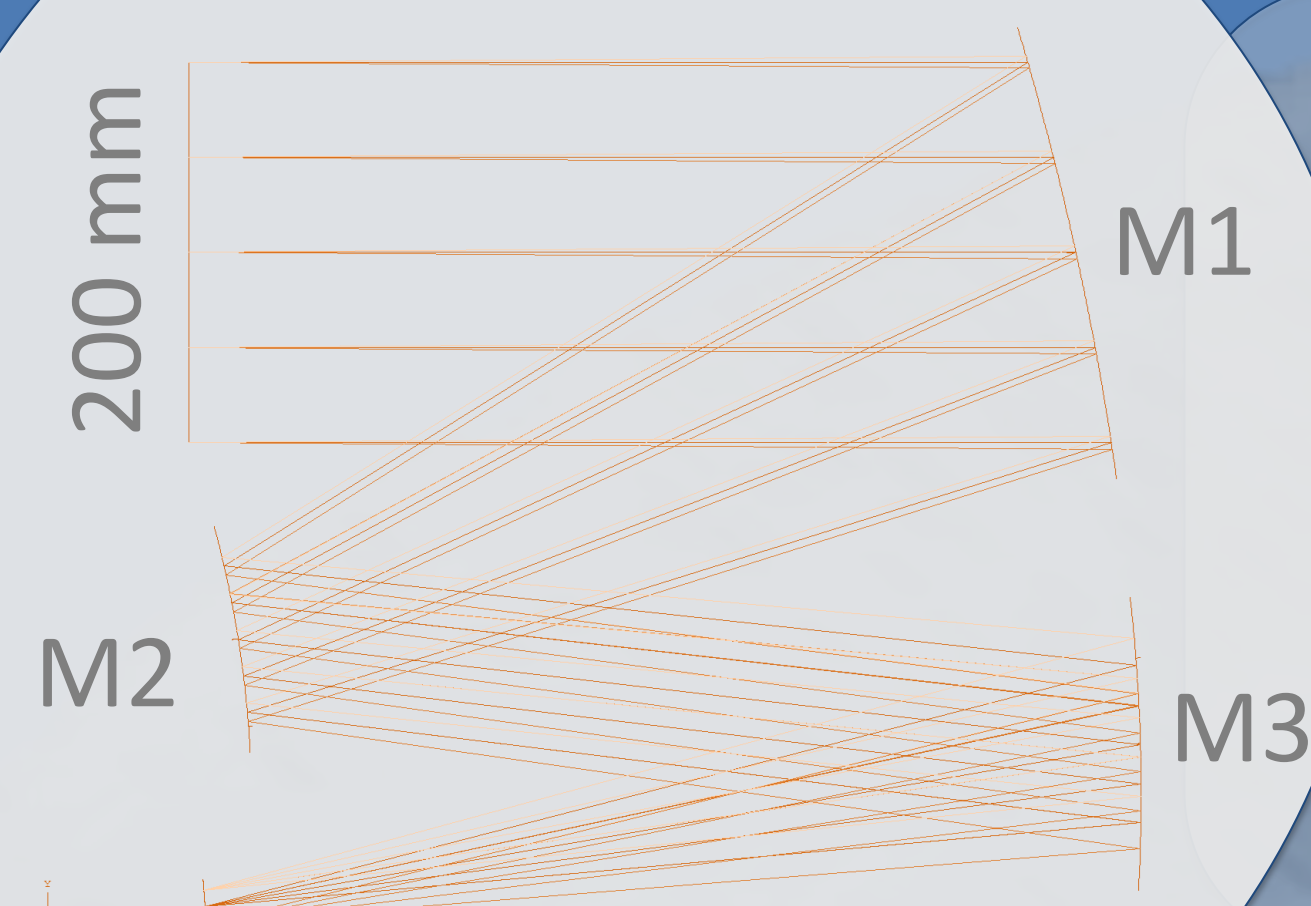
Focal Length	1200 mm
Aperture	200 mm
F/#	6.0
GSD @ 600 km	2.75
Field of View	1.08° x 0.81°
MTF @ Nyquist	64%
SNR	> 70
Approx size (m)	0.3 x 0.5 x 0.5
Mass	20 kg
Pixel Rate	158 Mpx/s
Power	13 W

STREEGO is an athermal, fully reflective telescope based on a three mirror anastigmat (TMA) design with a 200 mm aperture, focal length of 1.2 m, and across-track Field of View (FoV) of 2°. Leveraging on a large format two-dimensional CMOS sensor with a 5.5 μm pixel size, it delivers a nominal modulation transfer function (MTF) of 64% at Nyquist frequency and a ground sampling distance of 2.75 m from an altitude of 600 km. Detailed stray-light and tolerance analyses were performed and a worst-case thermal model was developed to ensure optimal image quality under operational conditions.

## Introduction

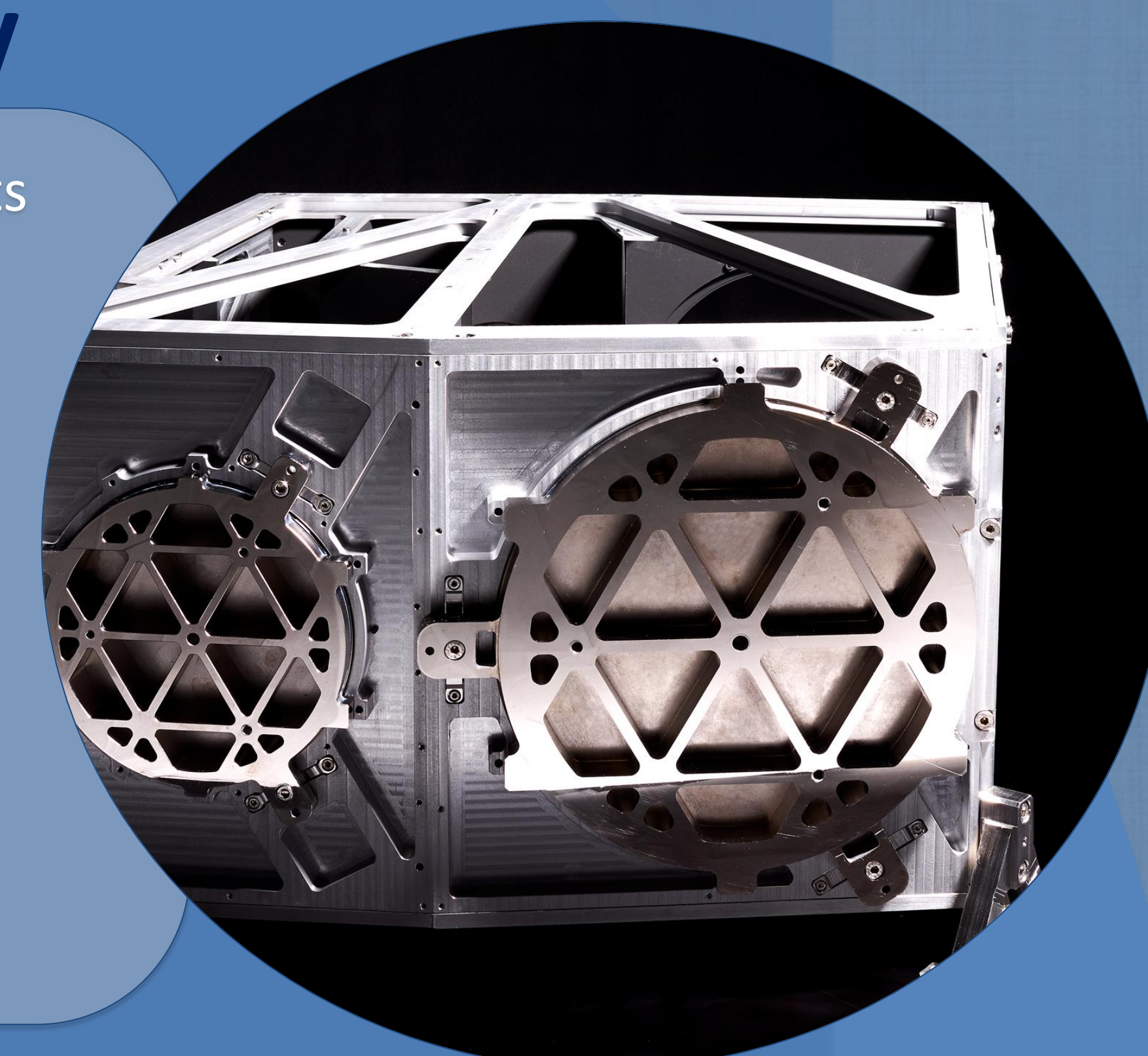
## Optical Design

STREEGO is based on off-axis, rotationally symmetric aspheres. This all reflective configuration allows an unobscured field of view with no chromatic aberration, greater image irradiance, and better MTF at medium spatial frequencies.



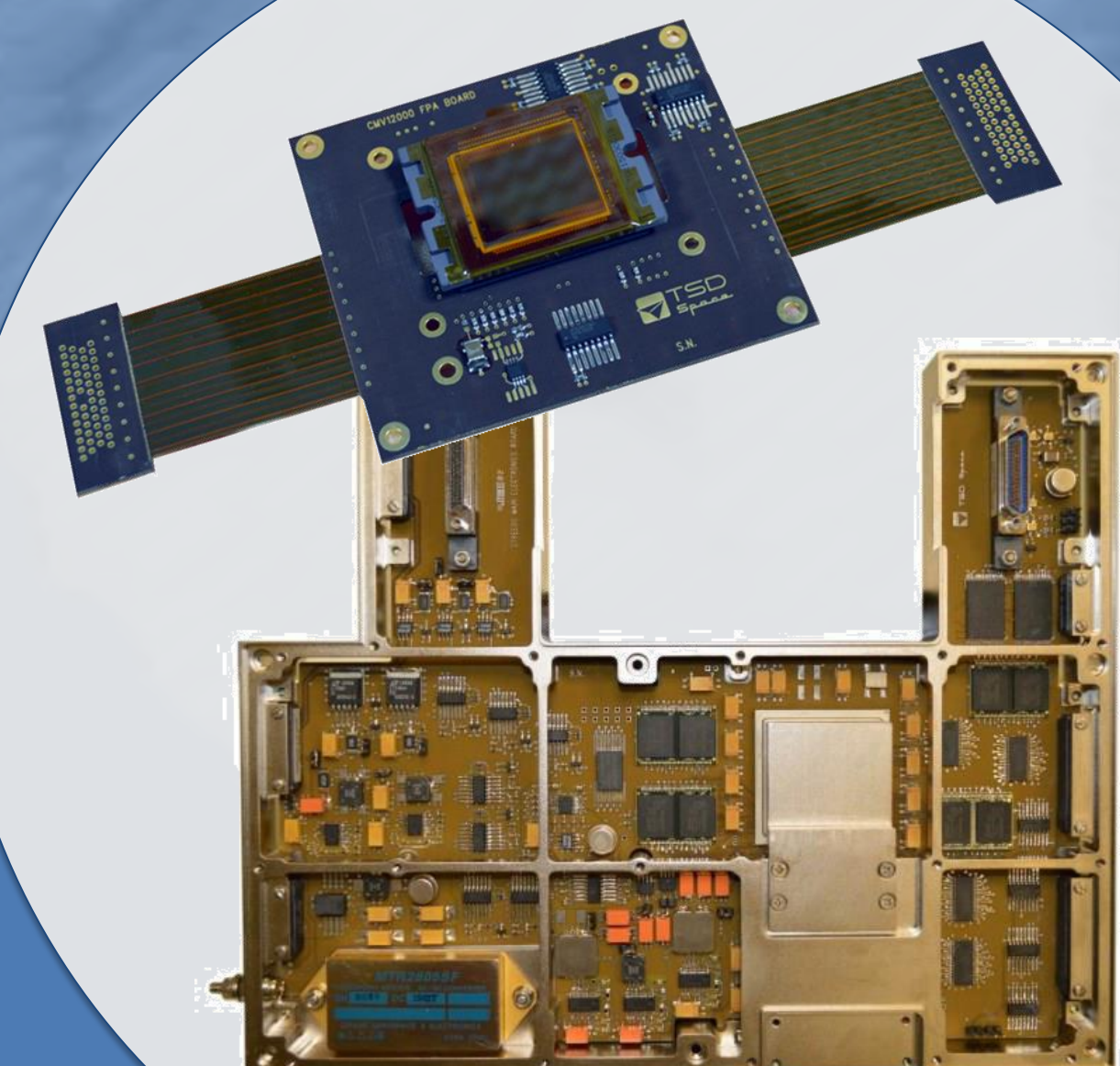
## Telescope Assembly

The Optical Telescope Assembly supports the TMA mirrors, an internal baffling system to minimize stray-light, and the Focal Plane Board with detector. Launch loads, low mass, high stiffness, and dimensional stability were the design drivers. The structure is made of AlSi alloy RSA-443, with the same CTE of the mirrors, thus achieving an athermal architecture that maximizes performances under operational loads.



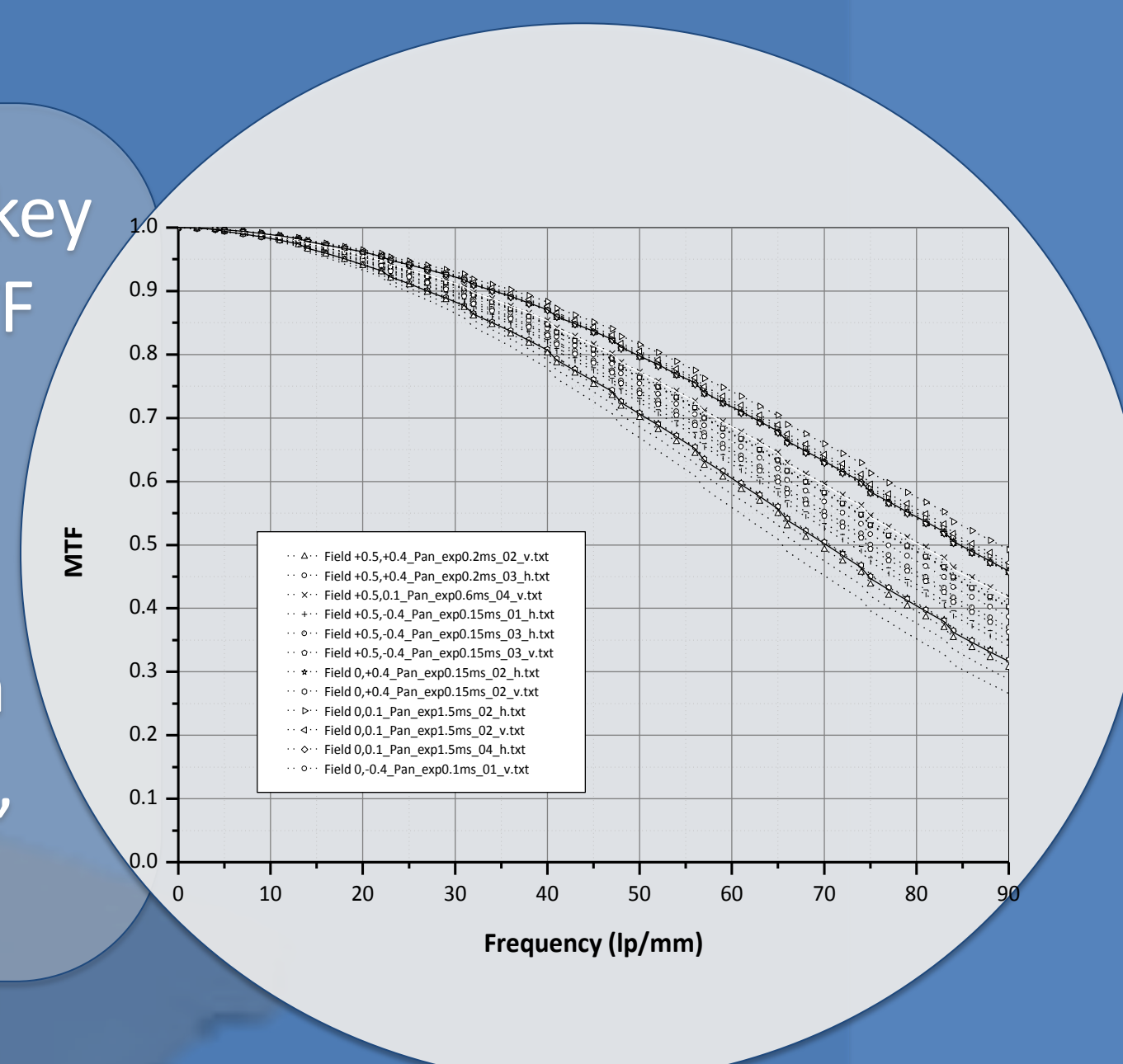
## Electronics

The electronics is based on a single PCB with four circuit sections, and a separate rigid-flexible PCB with the CMV12000 CMOS detector, by CMOSIS, in a commercial PGA ceramic package. Multispectral imaging is provided by a thin glass filter with equally spaced areas with panchromatic and 9 spectral bands.

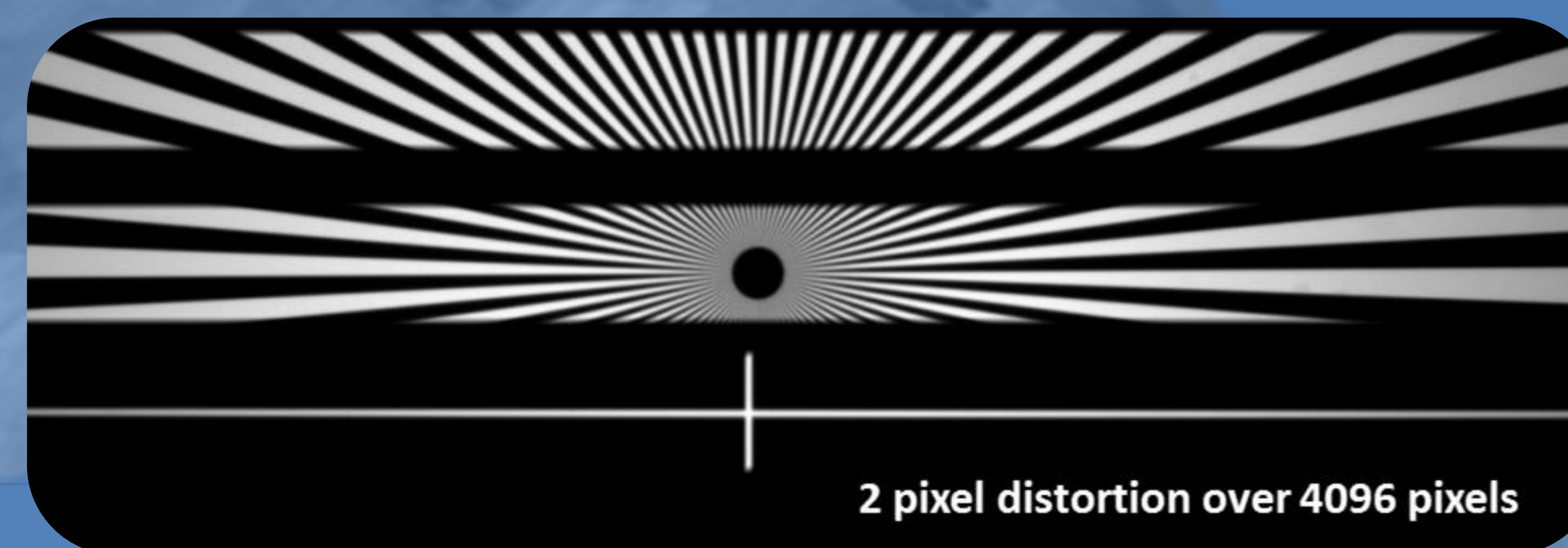


## Optical Tests MTF

The optical performance of the EM meets all key requirements, with 43 nm RMS WFE, 30% MTF at Nyquist (as built, including electronics), 1% linearity, and SNR greater than 100. CMM measurements have confirmed the positions of all the mirrors. Imaging tests with wide field collimator has shown sharp images, with minimum distortion.

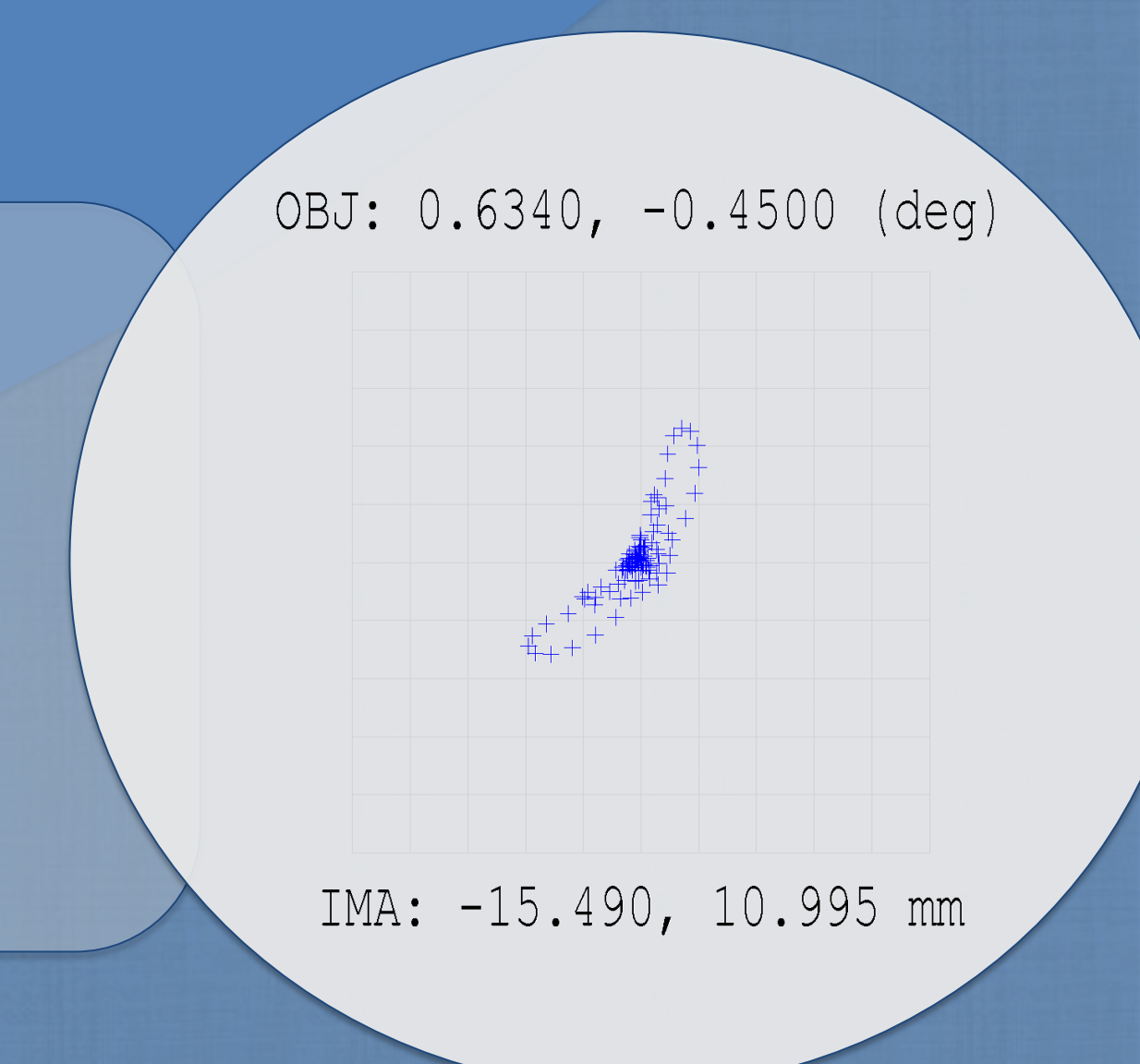


## Integrated Assembly



## Spot Diagram

The Airy disc of 6 μm radius (1.1 pixel) is a good compromise between GSD and contrast. STREEGO was named after its first design off-axis spot diagram resembling a flying Barn Owl (Strigiformae order).



## ABOUT MEDIA LARIO

Media Lario S.r.l. is a dynamic and innovative technology-driven company with more than two decades of experience supplying advanced optical components and optical systems. The company works with leading industrial and agency partners including ESA, ASI, and INAF. The company is located in Italy, within the industrial hub of Milan, an area rich with opto-mechanical expertise and experience with space programs.

