

Improved resolution of Questar-based optical inspection system

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Optical inspection technique at Fermilab

Kyoto system:

- 1.3GHz 9-cell cavity
- 1.3GHz single-cell cavity



Kyoto optical inspection system

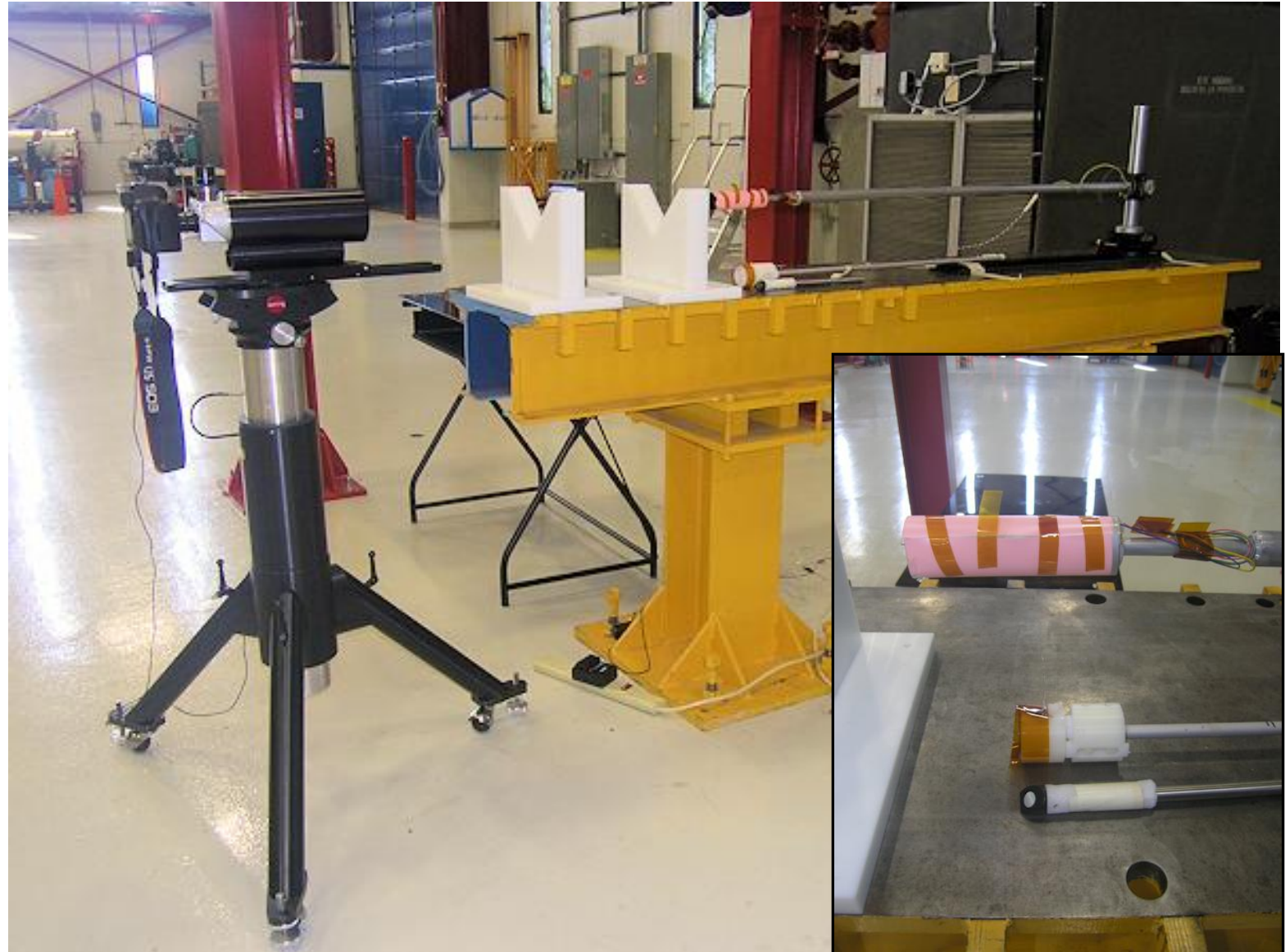
Questar system:

- 1.3GHz 9-cell dressed cavity
- 1.3GHz single-cell cavity
- 3.9GHz 9-cell cavity
- 3.9GHz single-cell cavity
- 1.3GHz Traveling wave cavity
- Spoke cavity
- 650MHz SRF cavity



Questar inspection system

Questar system



What's new



Before

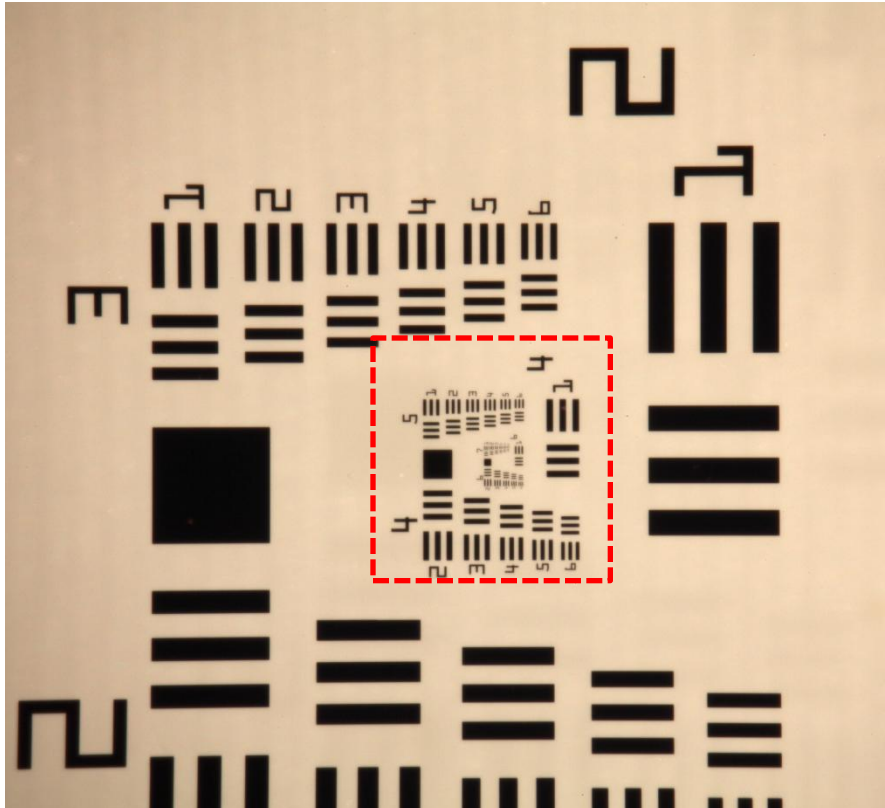


Now

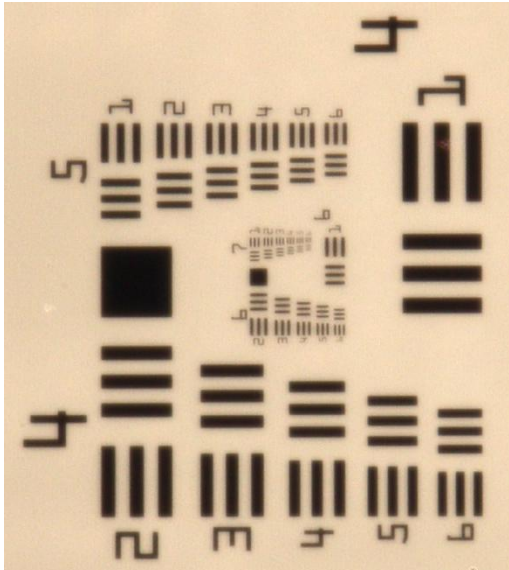
New digital camera: Canon EOS 5D mark II (21 Mpixel, ISO: 50 - 25600 expansion, 1080p HD video)

Stronger floor stand: Heavy duty.

Resolution comparison between Kyoto and Questar system



100% cropped image from center



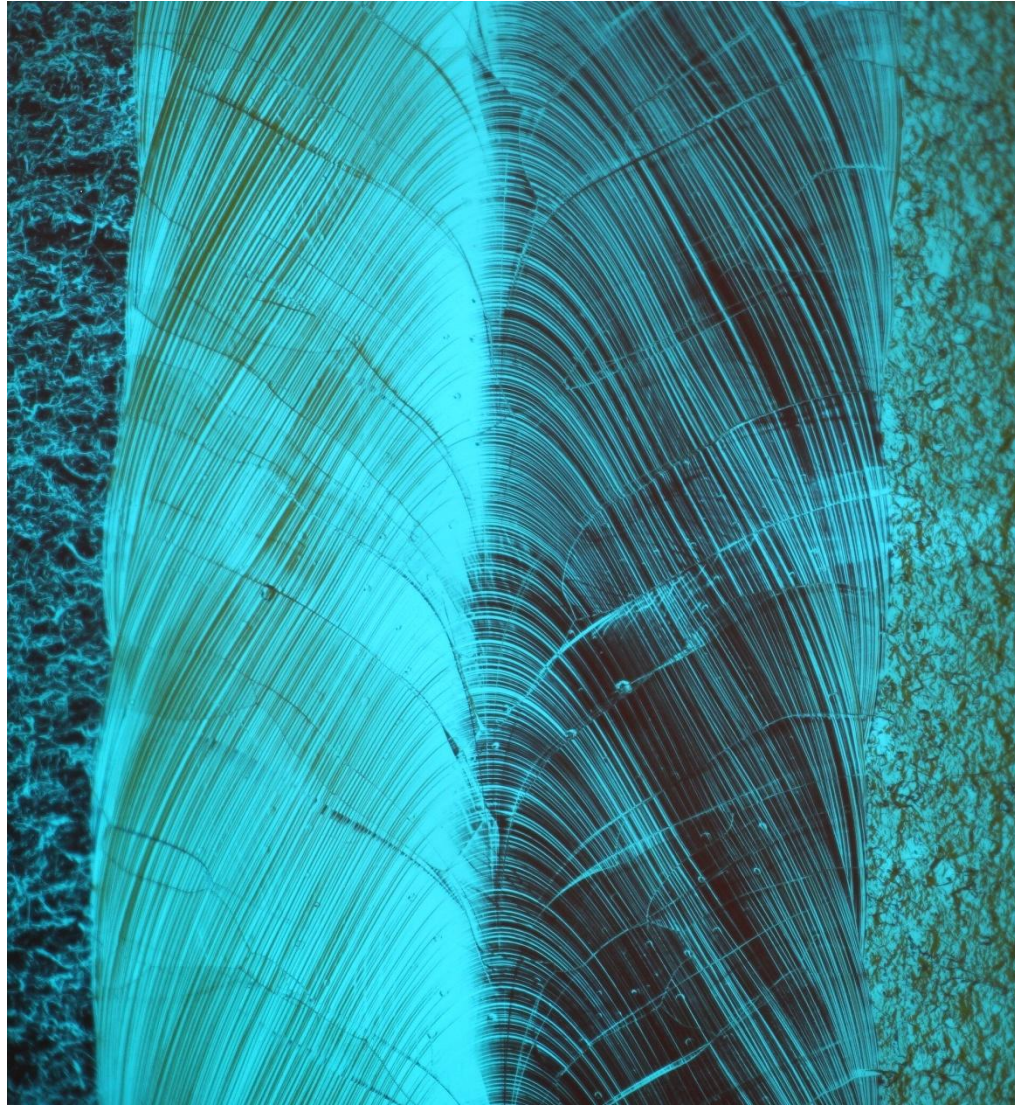
Kyoto system

Questar system

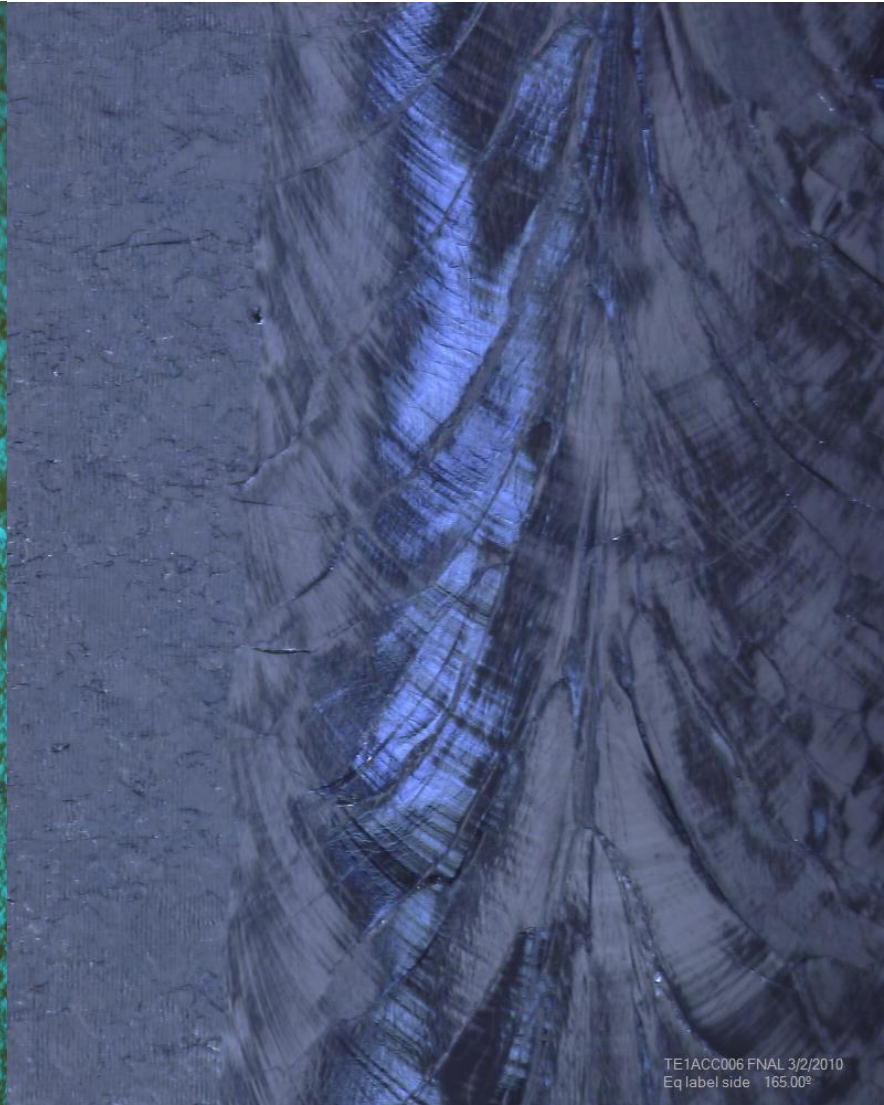
$$Resolution \left(\frac{lp}{mm} \right) = 2^{x^{Group+(element-1)/6}}$$

	Resolution (lp/mm)
Questar	181
Kyoto	32

Cavity images comparison

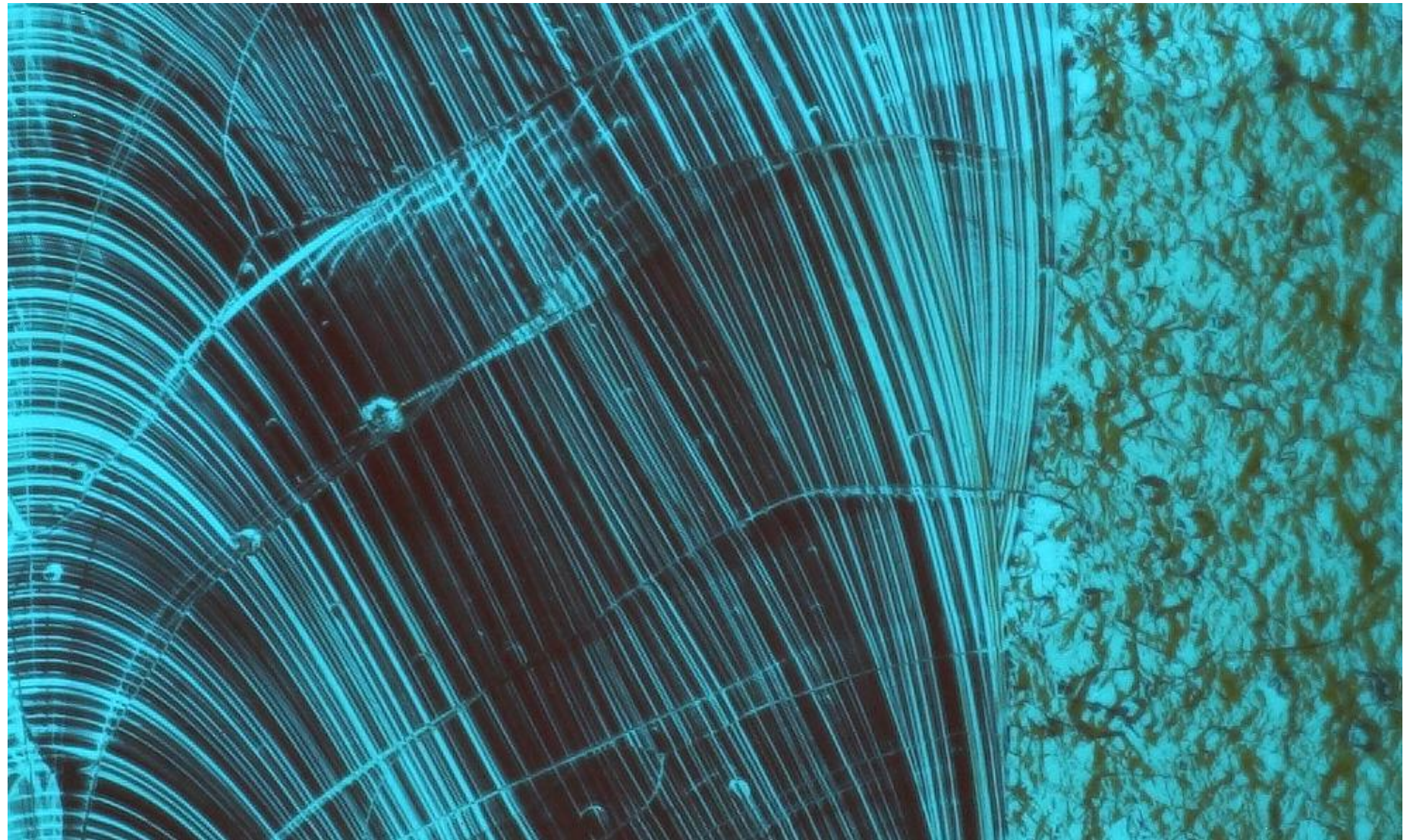


Questar system



Kyoto system

100% image



Future works

- To improve lighting.
- To build automatically moving stages.