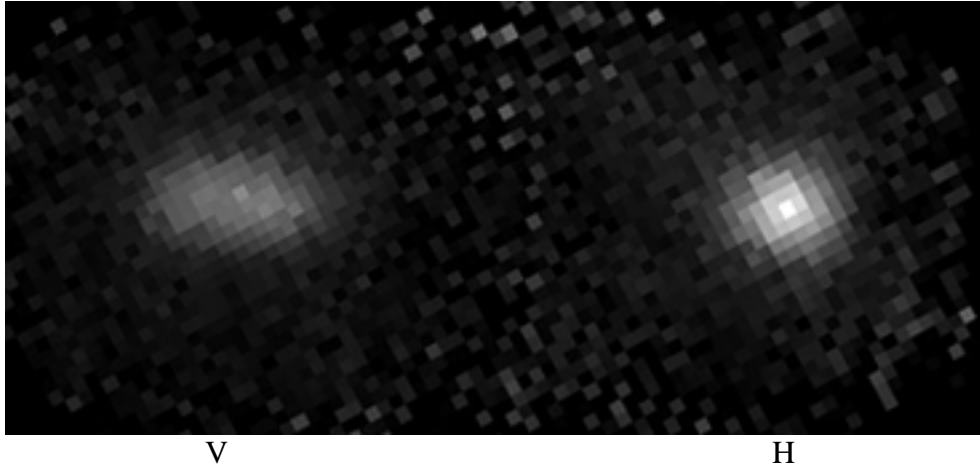


SHARP beam

The beam analysis can be found in the analysis logbook ([HL, 2006 Mar 30](#))

Here I summarize it with several figures and a table.

August 2005 (Mars)



January 2006 (Mars)

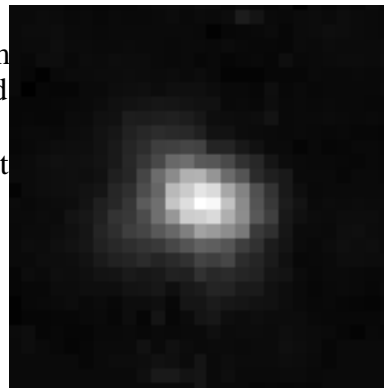


Fig. 1 In Aug., we have a serious X-grid problem which caused the V image almost twice as big and elongated as the H image. The problem was fixed and the two channels were very similar in Jan. But we found later that the images in Jan. are not as round as Aug.

Table 1: Comparisons between Aug. and Jan.

	August 2005	January 2006
real size of Mars (Roger)	12''	12''
Mars phase degree (Roger)	46	35
observed size of Mars	12.4'' (Martin)	13.7'' (Darren)
long axis/short axis	1.1 (H only; scan mode)	1.4 (average of H and V; Hertz mode)
gap between the Vgrids	~3/1000''	<1/1000''
alignment	Good (pin hole image centered)	one pixel below the center

Based on Roger's study of Mars, the differences of the beams between Aug. and Jan. can not be mainly due to the changing size and phase of Mars.

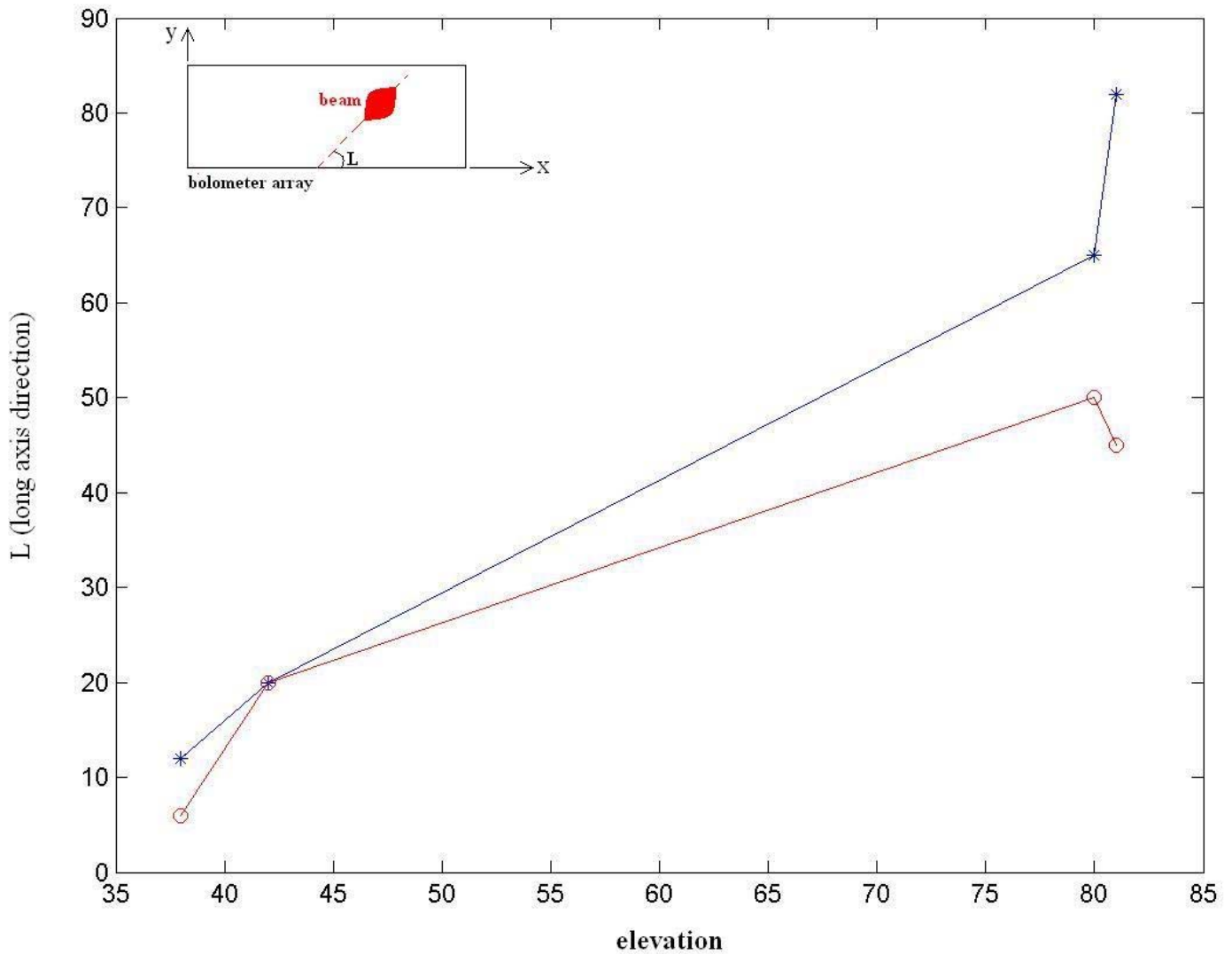
The only other difference I can think of is the alignment.

Fig. 2 The orientation of the long axis of Jan. beam varied with elevation:

The direction of the long axis is not fixed, which is different from what we should expect if the elongation is due to image distortion from SHARP.

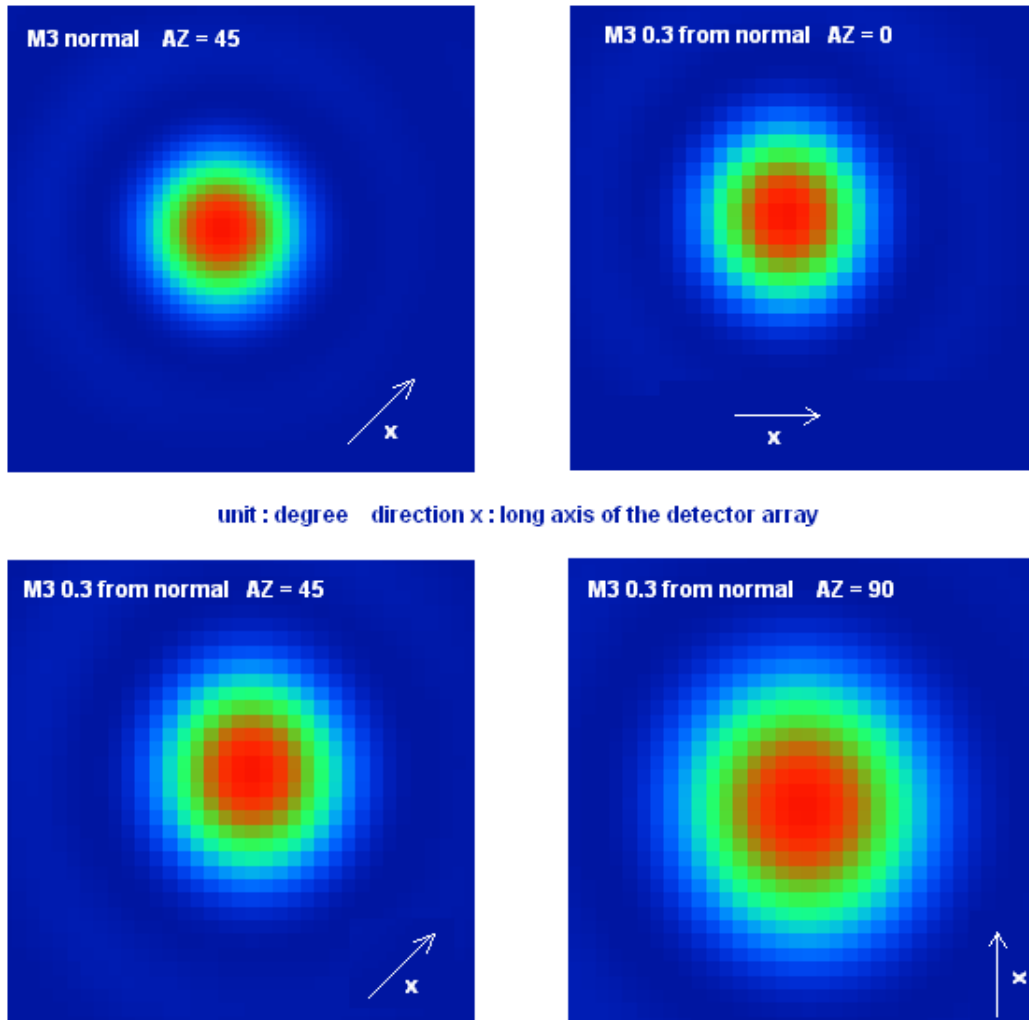
It does not vary with the focus (M2 position), either.

But it is clear that the elongation varies with elevation.



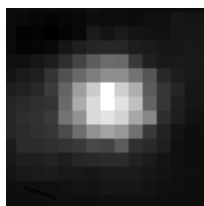
(the data are from [\(HL, 2006 Mar 30\)](#))

Fig. 3 The only way I can produce elevation depended beam elongation in ZEMAX is to tilt M3:



(note: the X axis shown here is the same with the legend in the previous figure 2)

The misalignment of M3 should also affect SHARC-II, but we did not see an elongated SHARC-II beam:



(Darren, 028148)

So we are not sure about the reason of the elevation depended elongation.