Revisiting the Impact of Atmospheric Effects on VIMOS Multi-Object Spectroscopic Observations

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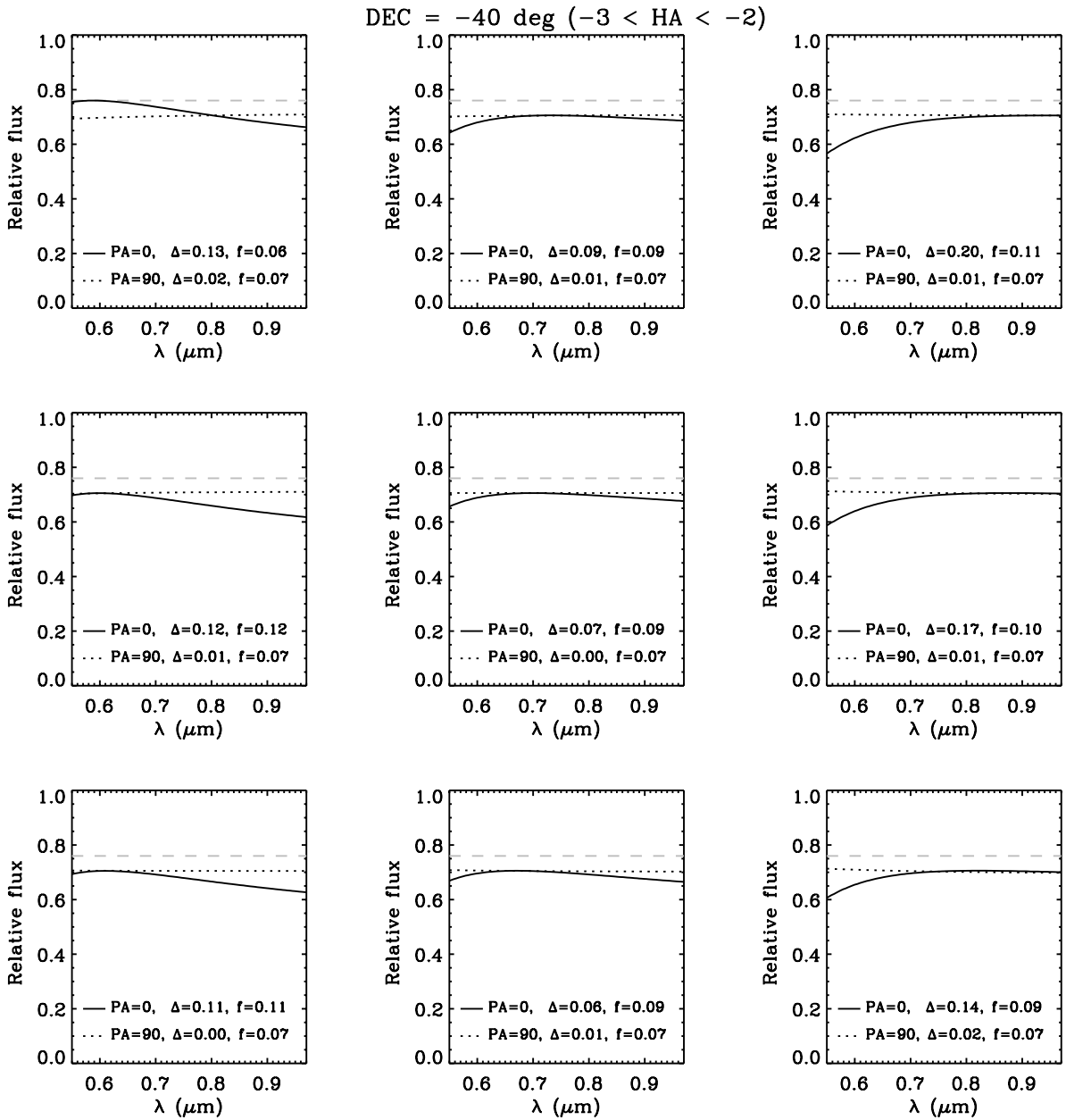
A model to address slitlosses in VIMOS-MOS

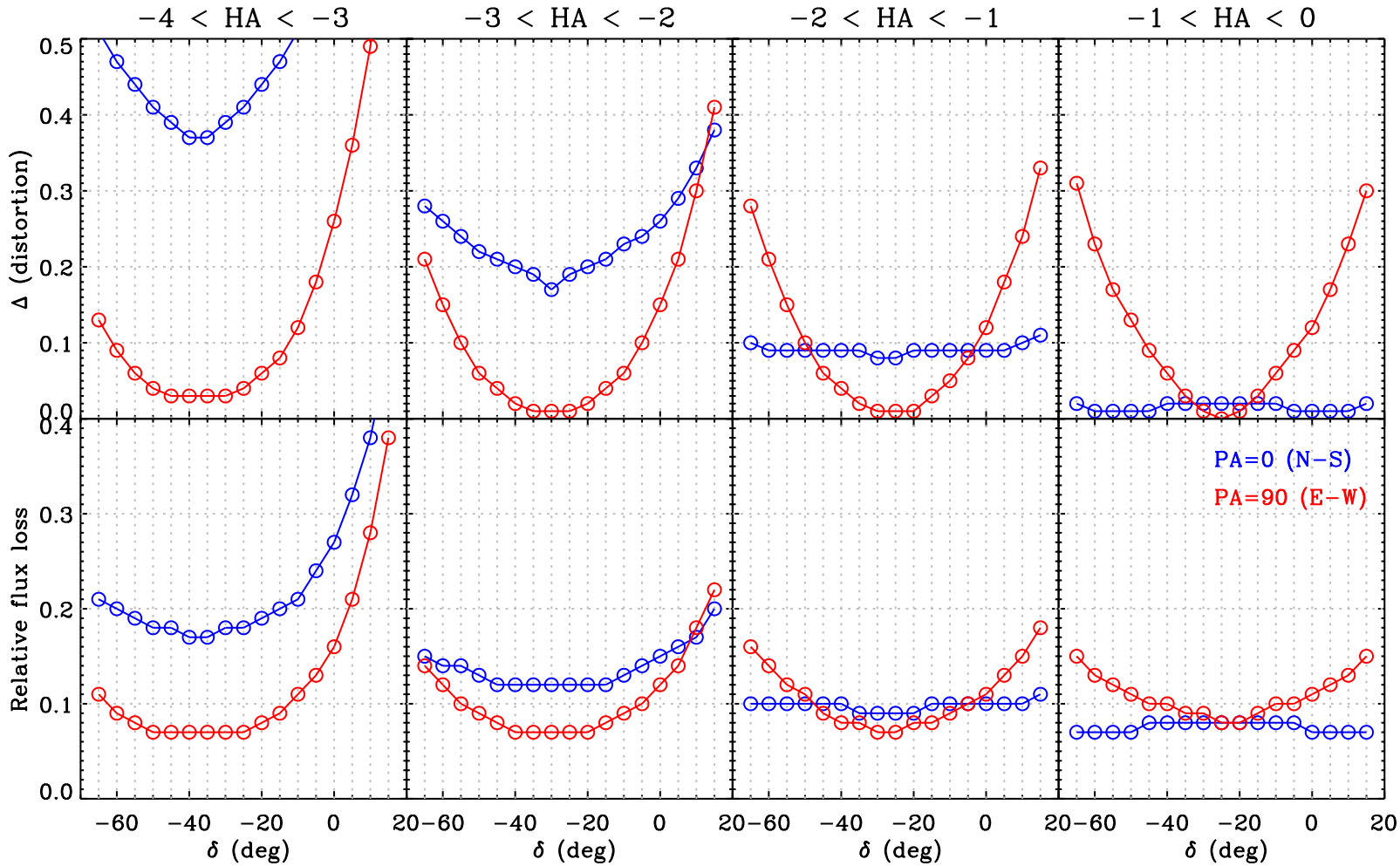
Fiducial Model

- 9 slits located in different positions of the VIMOS FoV, with relative separations of 7 arcmin.
- 10 arcsec slit-length and 1 arcsec slit-width.
- Gaussian seeing w/ FWHM $= 1$ arcsec
- 24% flux losses due to finite seeing and slit width.
- MR grism, $5500 < \lambda\,(\text{Å}) < 9700$.
- Two slits orientations at meridian crossing:
  PA $= 0$ (N-S), PA $= 90$ (E-W).
- Flat input spectrum.
- Figures of Merit:
  - Spectral distortion: $\Delta = (f_{max} - f_{min})/f_{max}$
  - Relative flux loss: $(\int f_\lambda)/(\int f_{\lambda,76\%})$

VIMOS slitlosses example: $\delta = -40$ deg, $-3 < HA < -2$



General trends as a function of δ, HA and FoV orientation



Conclusions

- PA $= 0$ (N-S) provides the most stable results ($\Delta < 0.1, f_{loss} < 0.1$) within $-2 < HA < 2$ – but not necessarily the *optimal* ones!
- Comparably good results can be obtained for $-45 \lesssim \delta \lesssim -5$ deg fields up to $HA = \pm 4$.