

LARES-2 Final Thermal Analysis

INTRODUCTION.

This analysis compares the final thermal analysis in Case 17 with an earlier analysis for Case 11. The phase changes due thermal gradients add to any gradients due to dihedral angle offsets. The sum of the phases may be either larger or smaller depending on whether the curvature of the two gradients is the same or opposite.

For the isothermal case, the divergence for a +1.25 arcsecond dihedral angle offset is virtually identical to the divergence for a -1.25 offset. When phase changes due to thermal gradients are added the divergence may either increase or decrease. The important part of the diffraction pattern is the annulus from about 32 to 40 microradians.

For both cases, the isothermal diffraction pattern with a +1.25 arcsecond dihedral angle offset is compared to the patterns with a thermal gradient plus either a +1.25 arcsecond or -1.25 dihedral angle.

CASE 17.

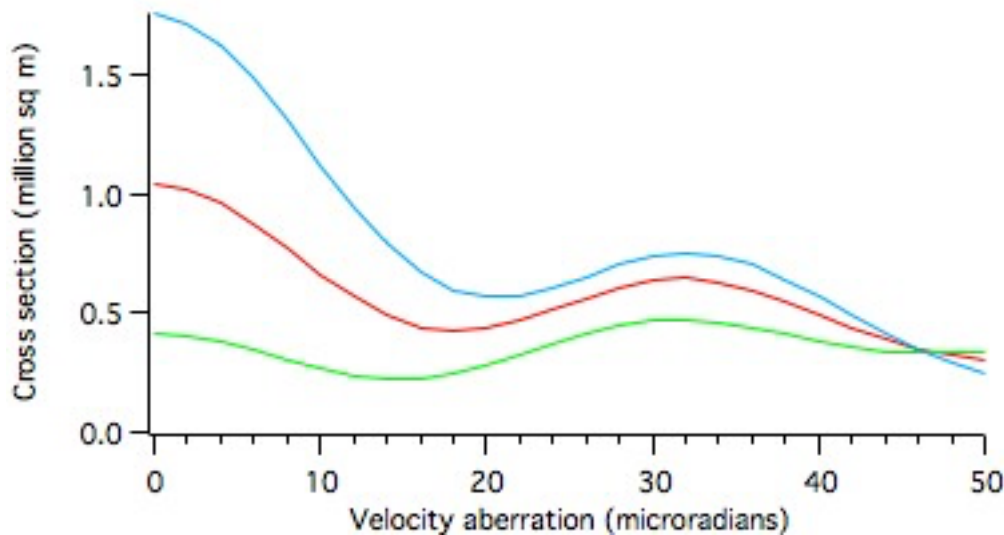


Figure 1. Cross section vs Velocity aberration for Case 17.

Red = isothermal with a +1.25 arcsecond dihedral angle offset

Green = thermal gradient with a -1.25 arcsecond offset

Blue = Thermal gradient with a +1.25 arcsecond offset

CASE 11.

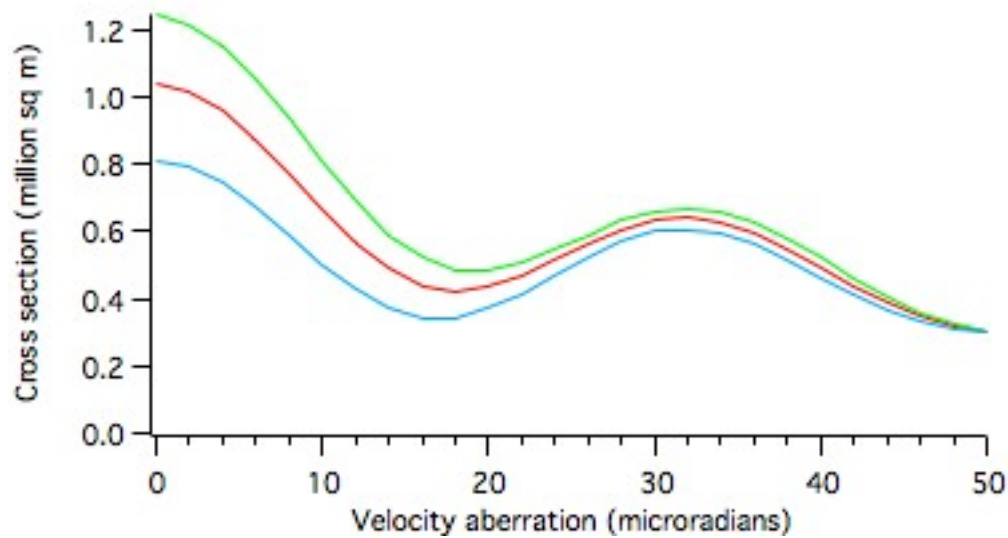


Figure 2. Cross section vs Velocity aberration for Case 11.

Red = isothermal with a +1.25 arcsecond dihedral angle offset

Green = thermal gradient with a -1.25 arcsecond offset

Blue = Thermal gradient with a +1.25 arcsecond offset

COMPARISON.

The isothermal cross section with a dihedral angle offset of 1.25 arcseconds is 0.643655 million sq m at velocity aberration 32 microradians. The cross sections in the tables below are at 32 microradians velocity aberration.

Case 17

Cross section	Dihedral angle	Ratio to isothermal	% change
0.470063	-1.25	0.73	-.27
0.748049	+1.25	1.16	+.16

Case 11

Cross section	Dihedral angle	Ratio to isothermal	% change
0.669622	-1.25	1.04	+.04
0.607758	+1.25	0.94	-.06

The average % change in cross section for case 17 is 21.5%. The average change for case 11 is 5%. The variation of the cross section is 4 times as great for Case 17.