

Recent Progress in Plasma Configuration Studies

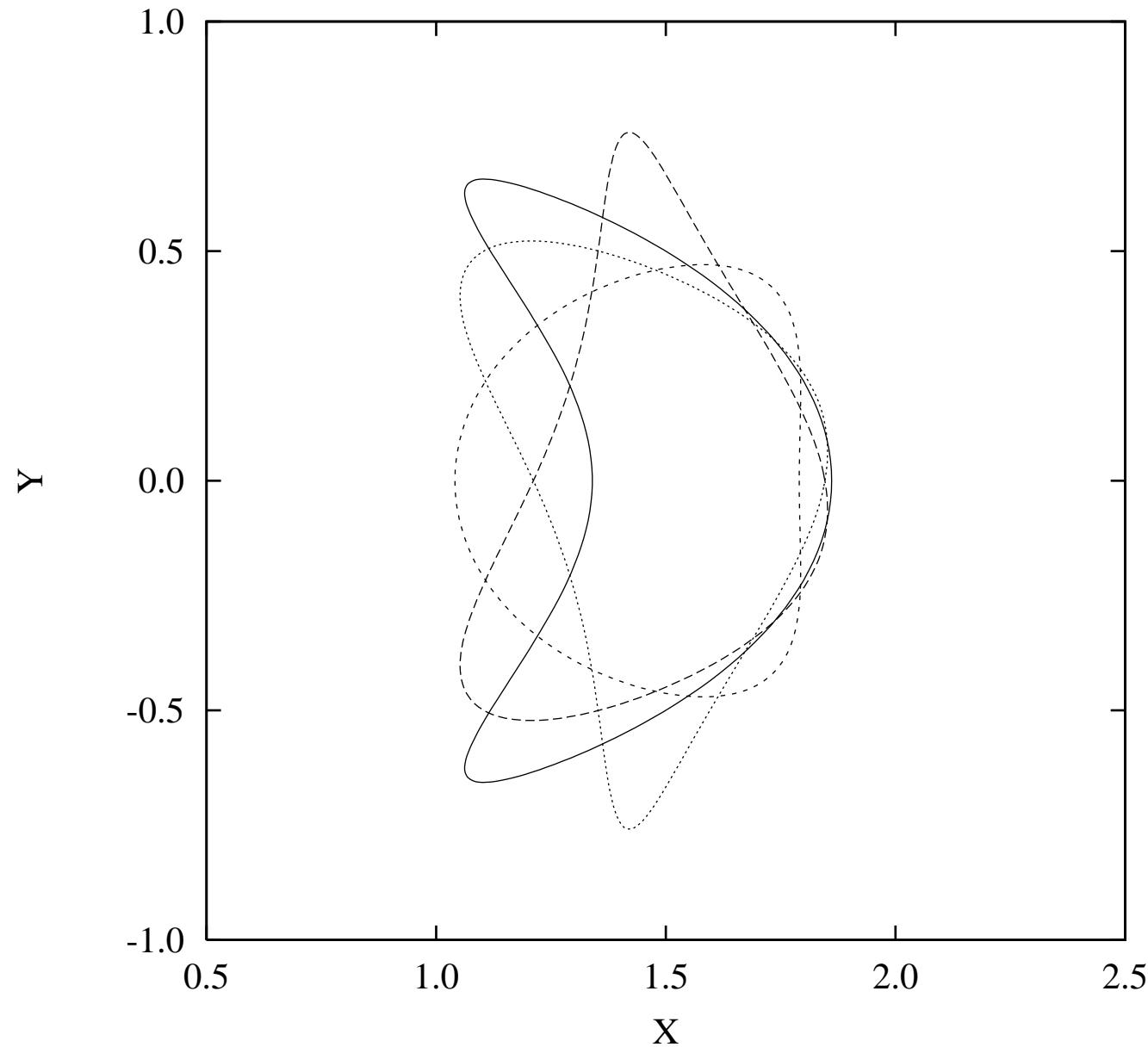
- The external kink, Mercier, and ballooning stability criteria have been incorporated into the optimizer.
 - Terpsichore/global for kink (modified version by Fu),
 - Terpsichore/ballooning for mercier and ballooning,
 - Typical timing and memory for one function call
 - » VMEC equilibrium and boozer mapping (33 surfaces) : 20 s, 2 MW
 - » kink calculation (33 internal + 24 vacuum grids): 25 s, 23 MW
 - » mercier and mapping (16 surfaces): 67 s, 23 MW
 - » ballooning integration (7 surfaces): 2.5 s, 0.4 MW

- **New configurations, optimized for QA and stability at a fixed plasma current and pressure, are being developed.**
 - monotonically increasing iota profile, 0.25 - 0.45
 - A=3.4, Volume=5 m³
 - beta ~ 4%, I_p~200 kA.
 - examples:
 - » qas3_c10/c12 (figs. 1-6)
 - » qas3_h3v (figs. 7-9)
 - » qas2_a11 (figs. 10-12)

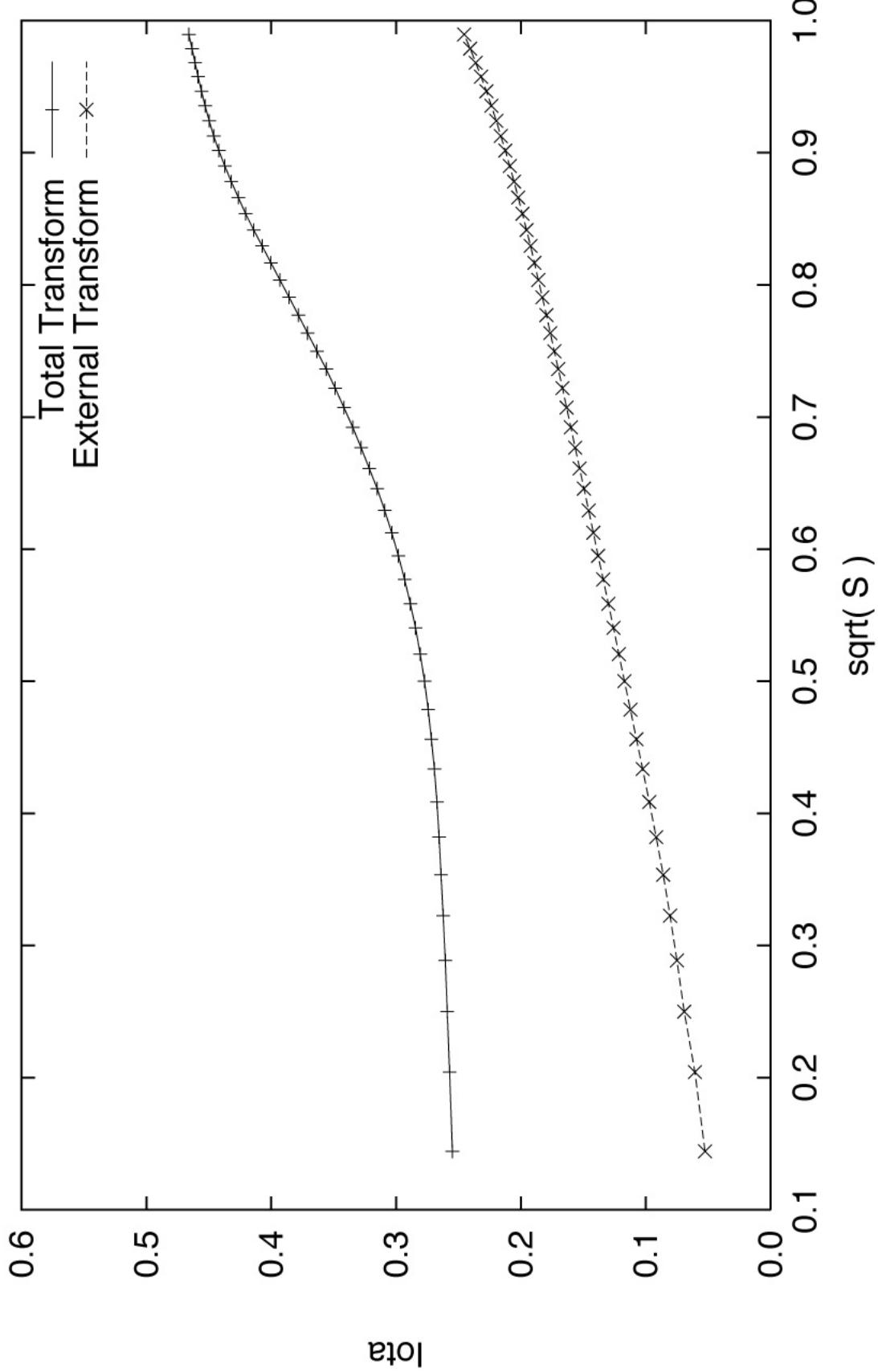
- **List of figures:**

- fig. 1: qas3_c10, geometry
- fig. 2: qas3_c10, iota profile
- fig. 3: qas3_c10, mod B
- fig. 4: qas3_c12, geometry
- fig. 5: qas3_c12, iota profile
- fig. 6: qas3_c12, mod B
- fig. 7: qas3_h3v, geometry
- fig. 8: qas3_h3v, iota profile
- fig. 9: qas3_h3v, mod B
- fig. 10: qas2_a11, geometry
- fig. 11: qas2_a11, iota profile
- fig. 12: qas2_a11, mod B

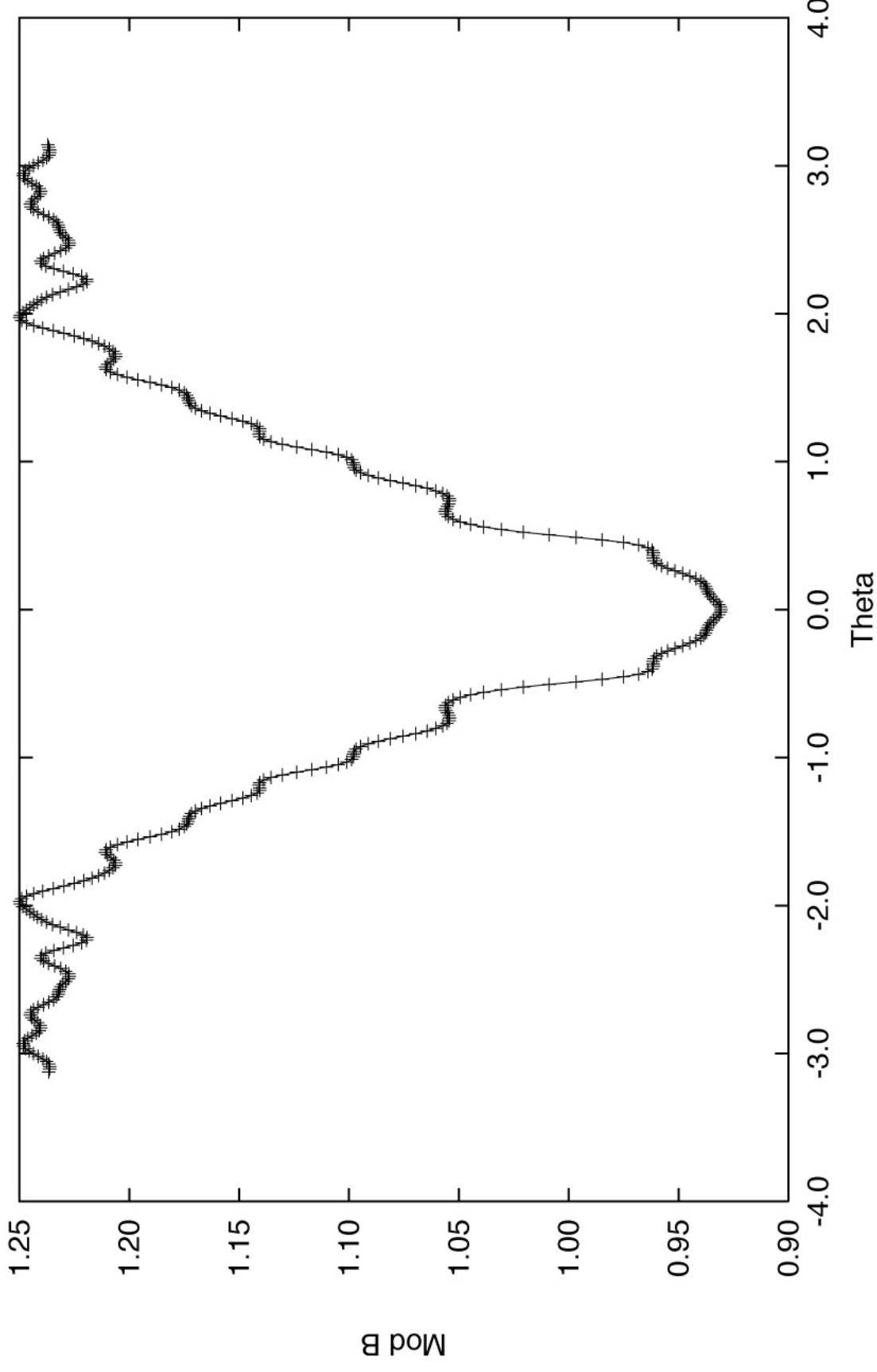
Cross Sections of QAS3_c10



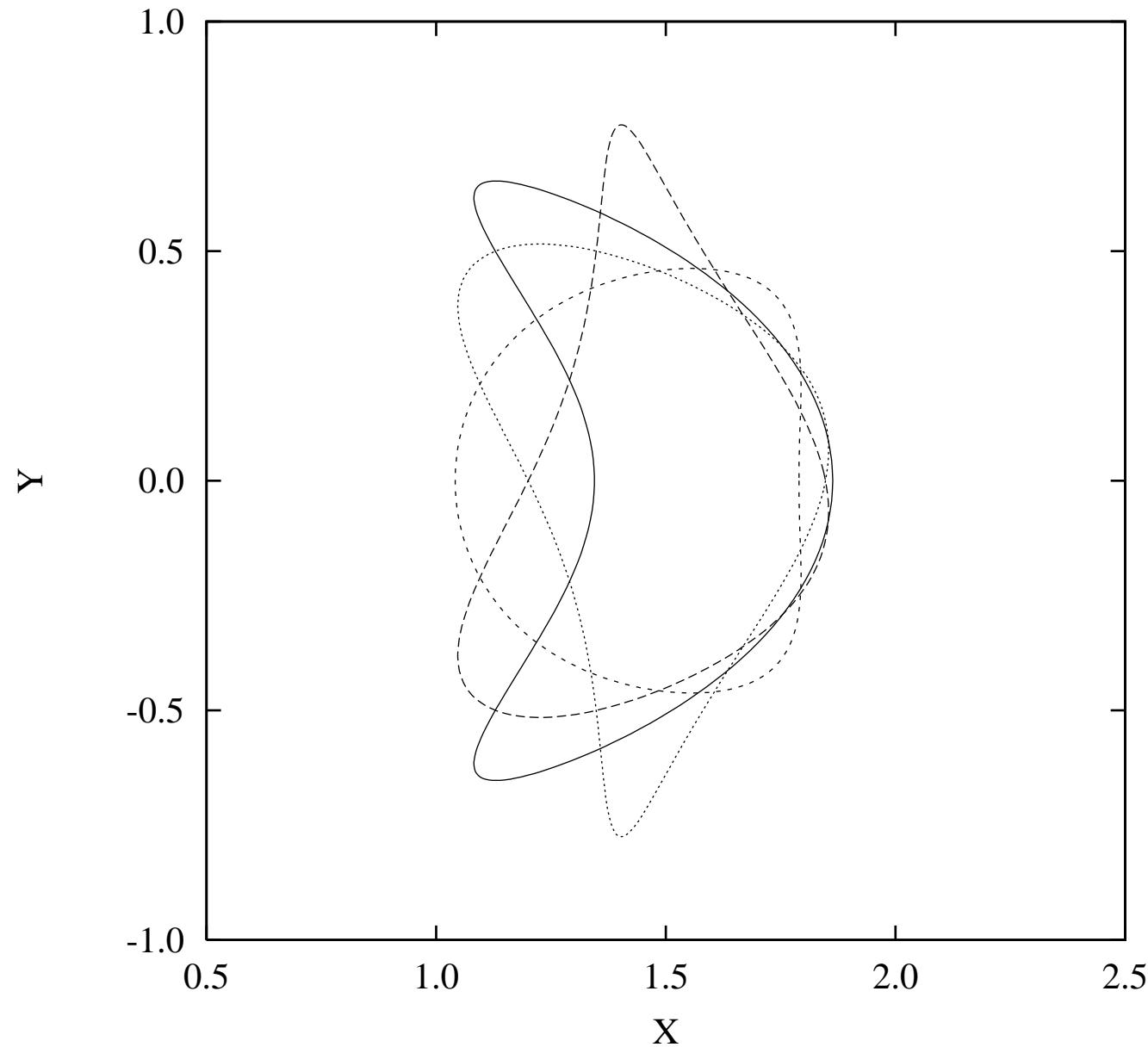
Rotational Transform Profile, Case c10



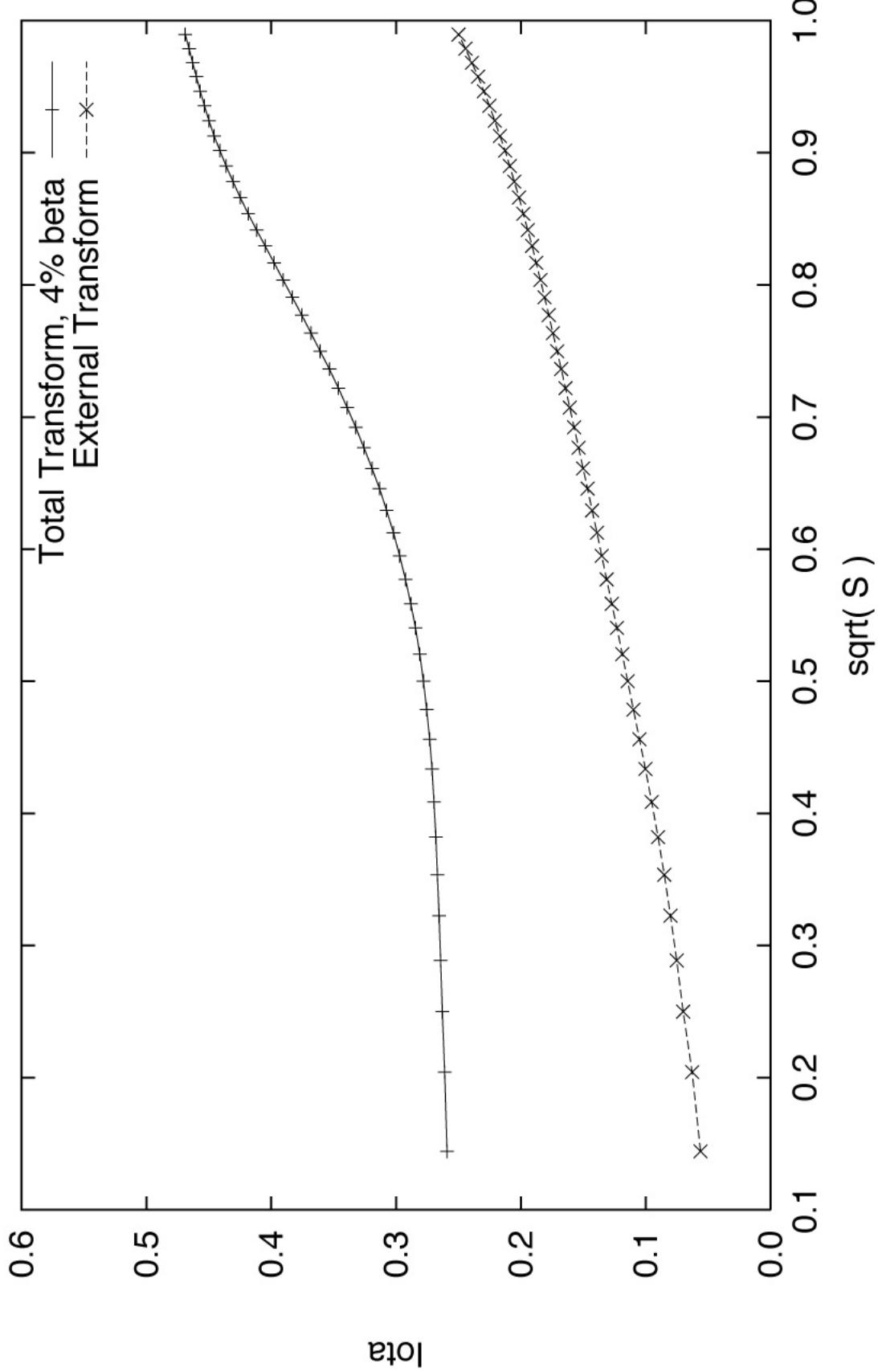
Mod B vs Poloidal Angle Along Field Line at S=0.55, QASS3_c10



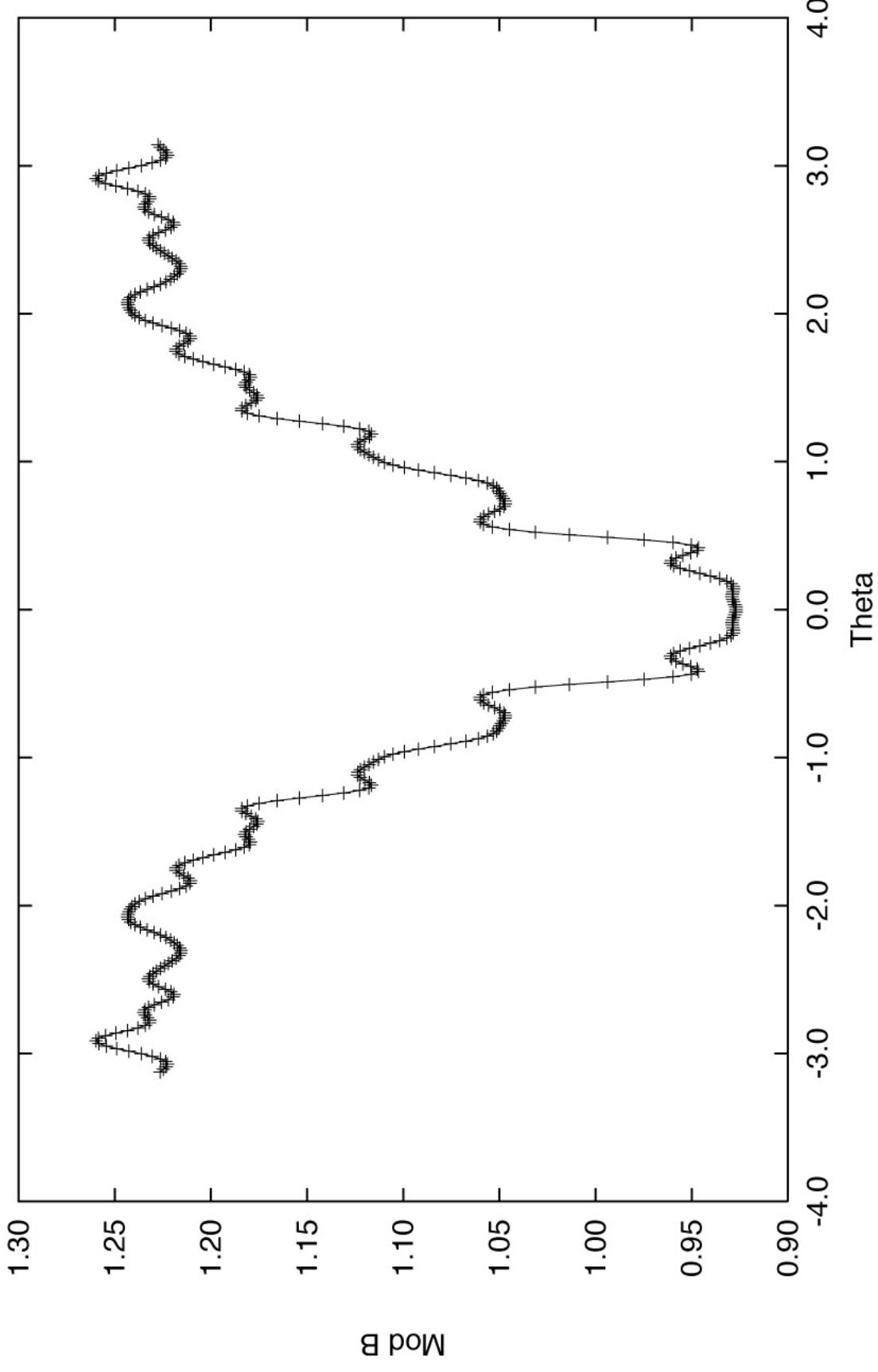
Cross Sections of QAS3_c12



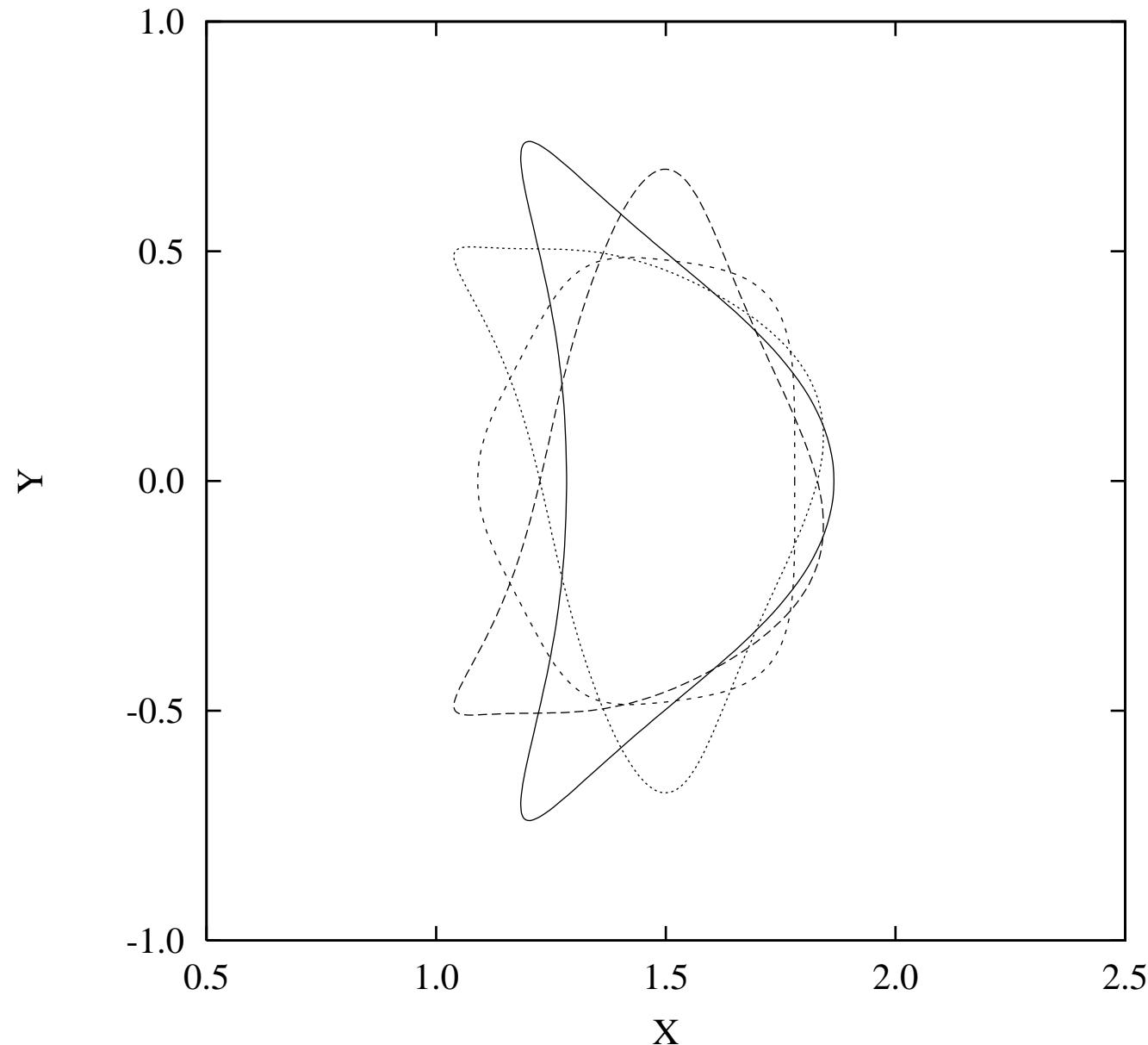
Rotational Transform Profile, Case c12



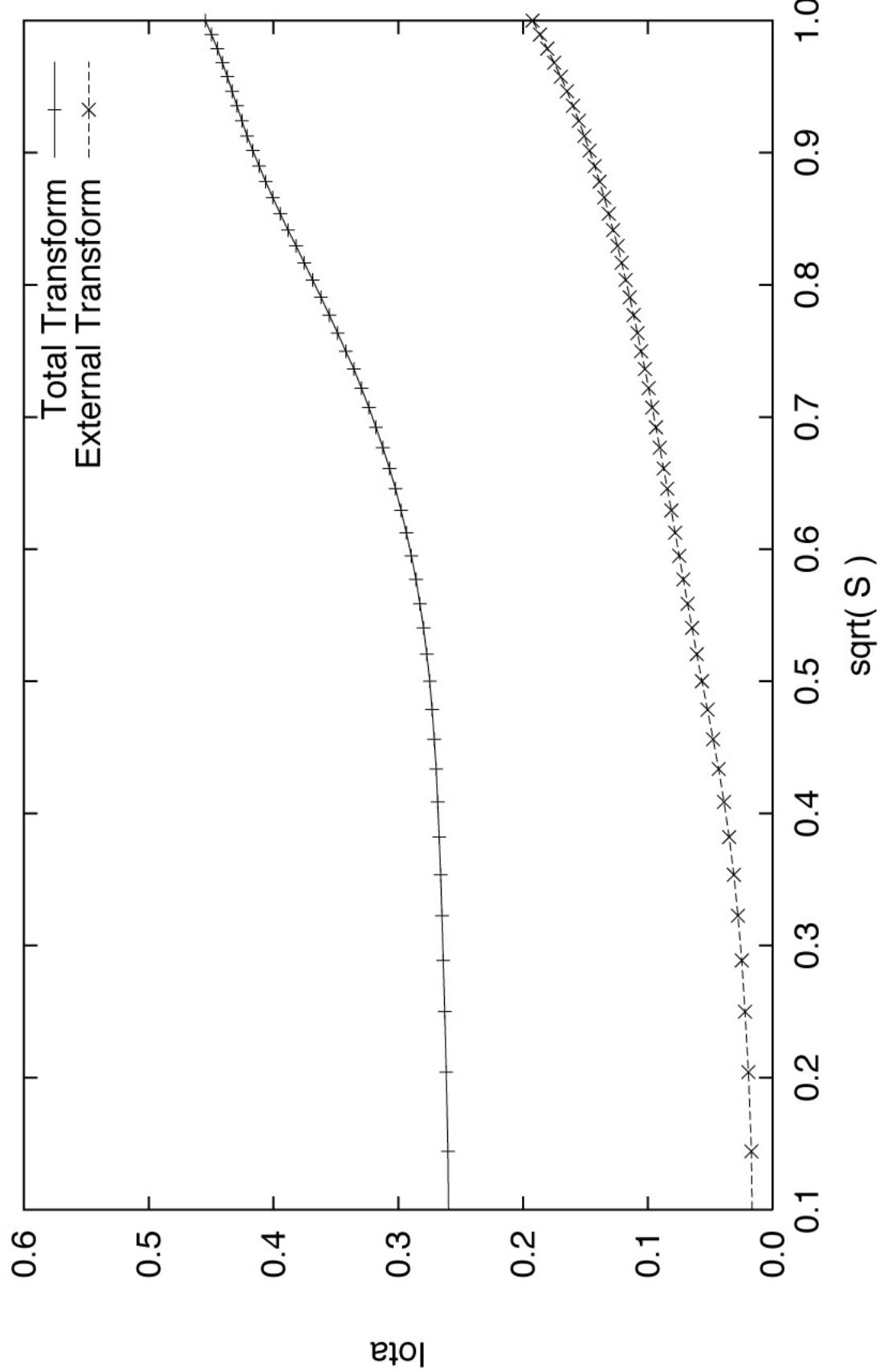
Mod B vs Poloidal Angle Along Field Line at S=0.55, QASS3_c12

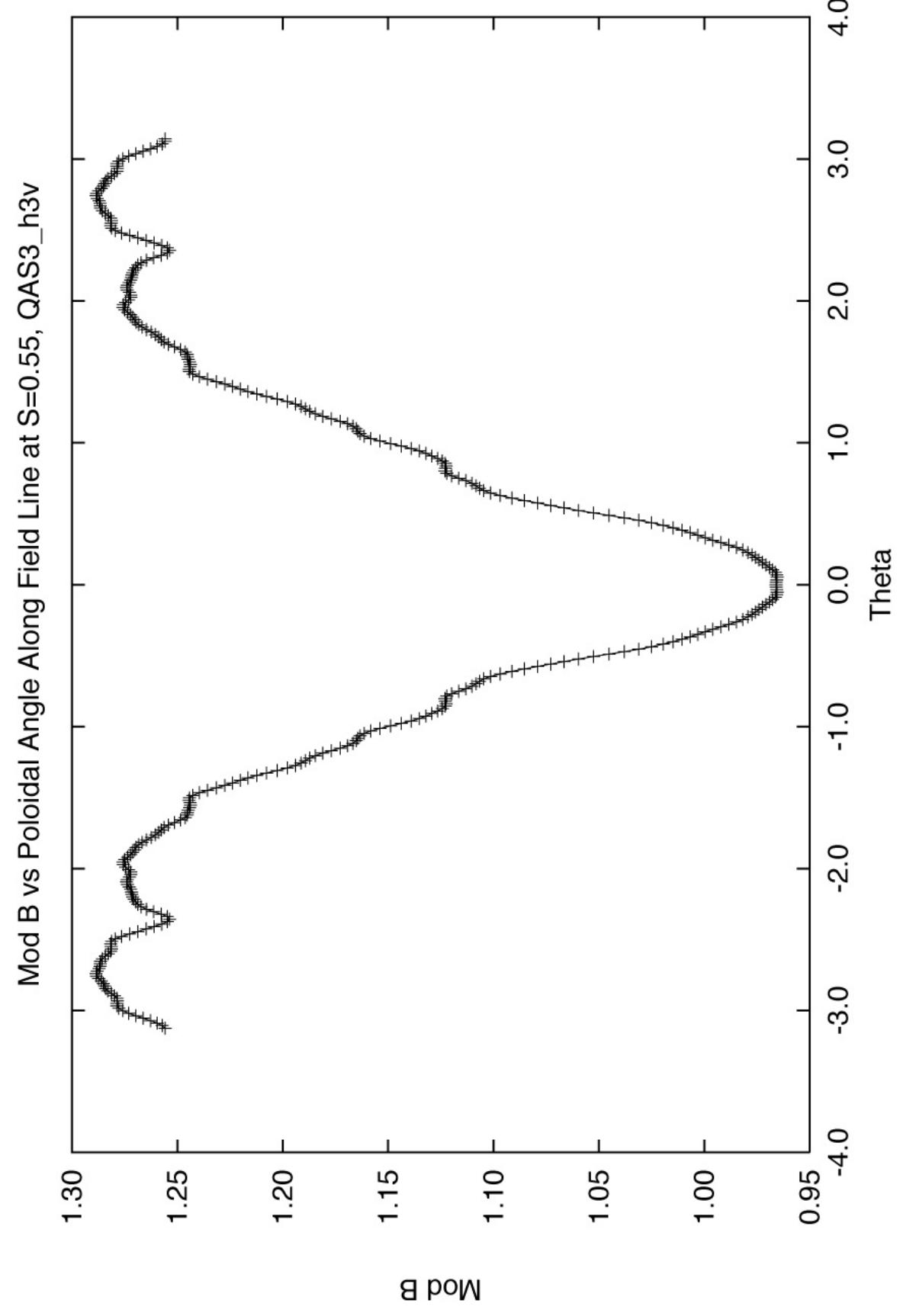


Cross Sections of QAS3_h3v

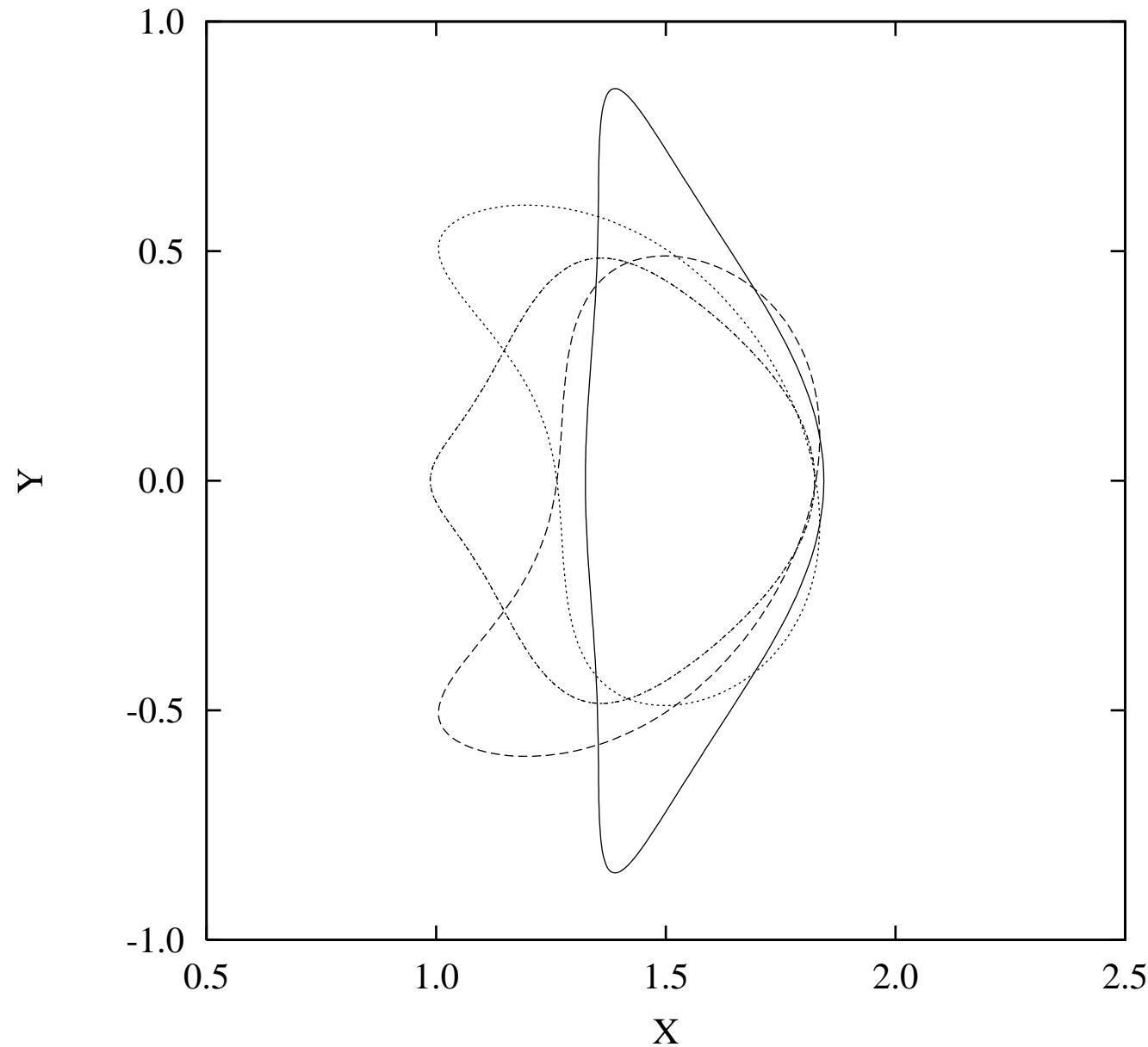


Comparison of Rotational Transform Profile, QAS_A3.3_NF3_h3

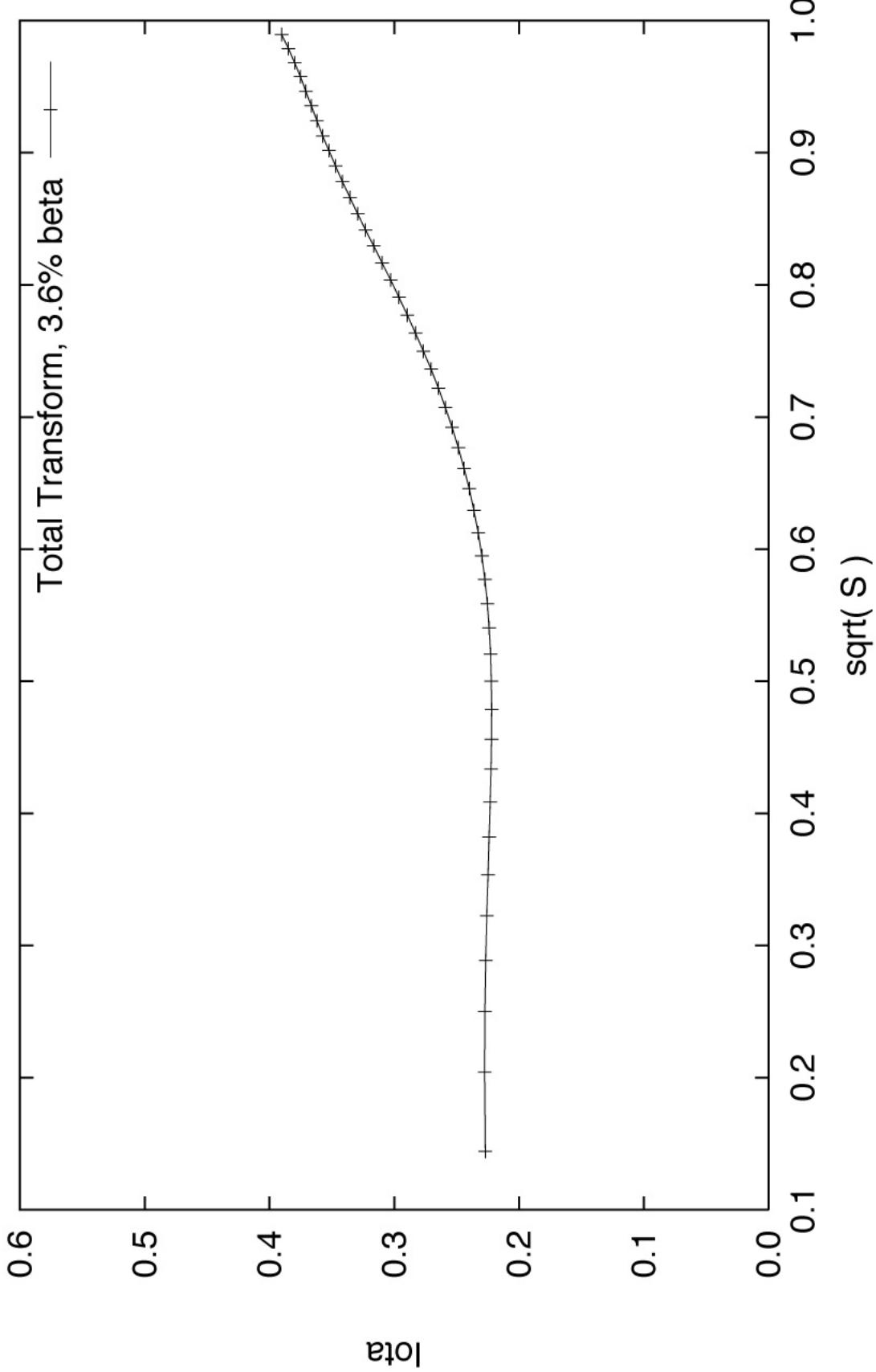




Cross Sections of QAS2_a11



Rotational Transform Profile, QAS2_a11



Mod B vs Poloidal Angle Along Field Line at S=0.55, QAS2_a11

