Magnetic Surface Evaluation of Free Boundary Equilibria with the PIES code

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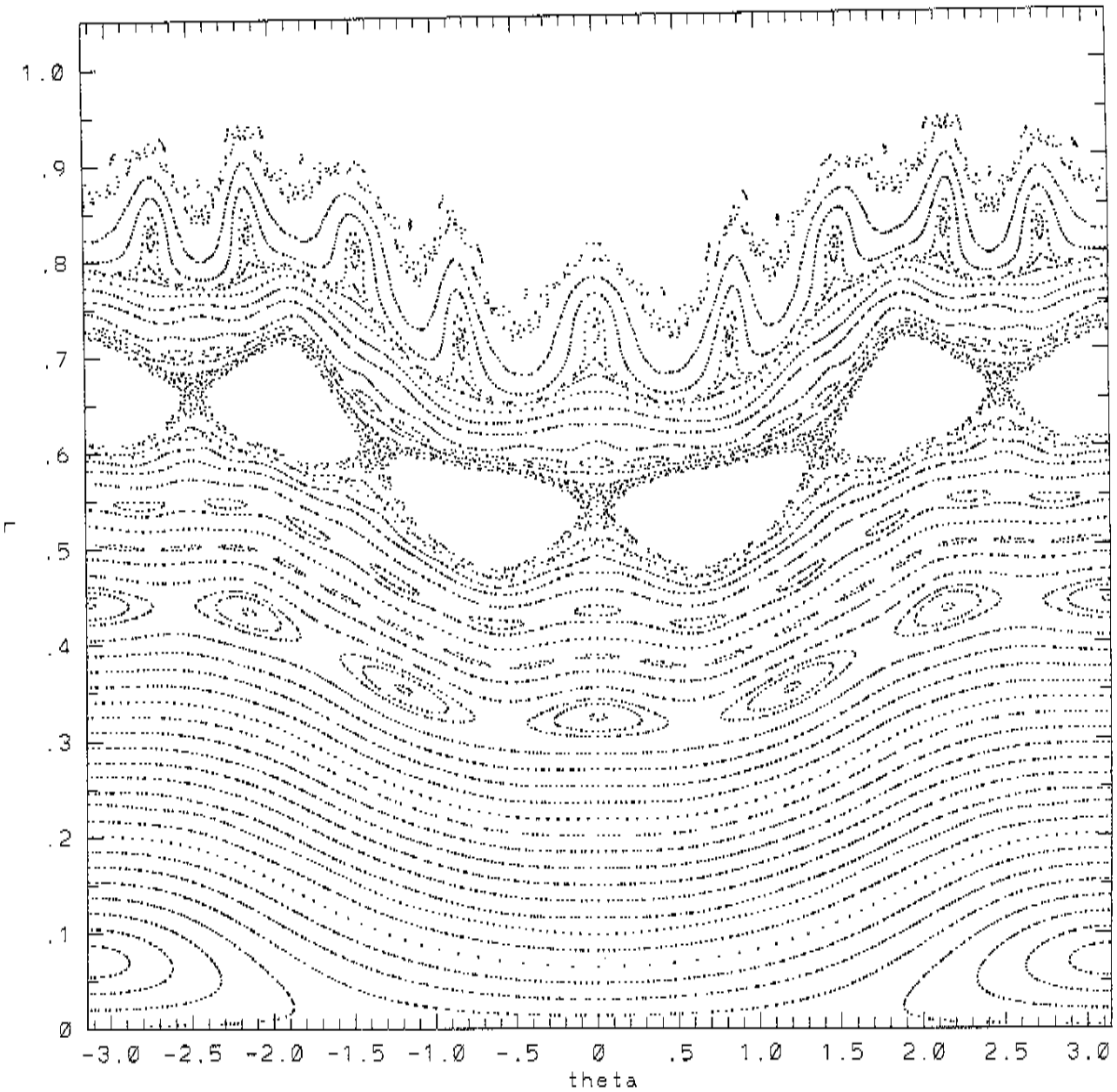
Outline

- Surface Quality for LI383 - full beta, full current - free boundary.
  - Saddle coils - SAD1, 08_11_00 (d1826.11.126.60.4), 4 coils, GA optimized, not free boundary optimized
  - Modular coils - MOD1, 08_23_00 free boundary optimized with PF
  - Modular coils - MOD2, 09_07_00 same as 08_23_00 but not free boundary optimized (no PF)
  - Modular coils - MOD3, 09_07_00L - 230 KA of plasma current rather than the reference 250 KA
  - Saddle coils - SAD2, (d1826.11.126.60.7.10a), 7 coils, GA optimized, not free boundary optimized

    * d1826.11.126.60.7.10a 0.56 3.34 22.3
    * d1826.11.126.60.4 0.87 3.79 17.0
    * Coil set, Mean B_error (%), Max B_error (%), Current Density (kA/cm2)
- Pies Update

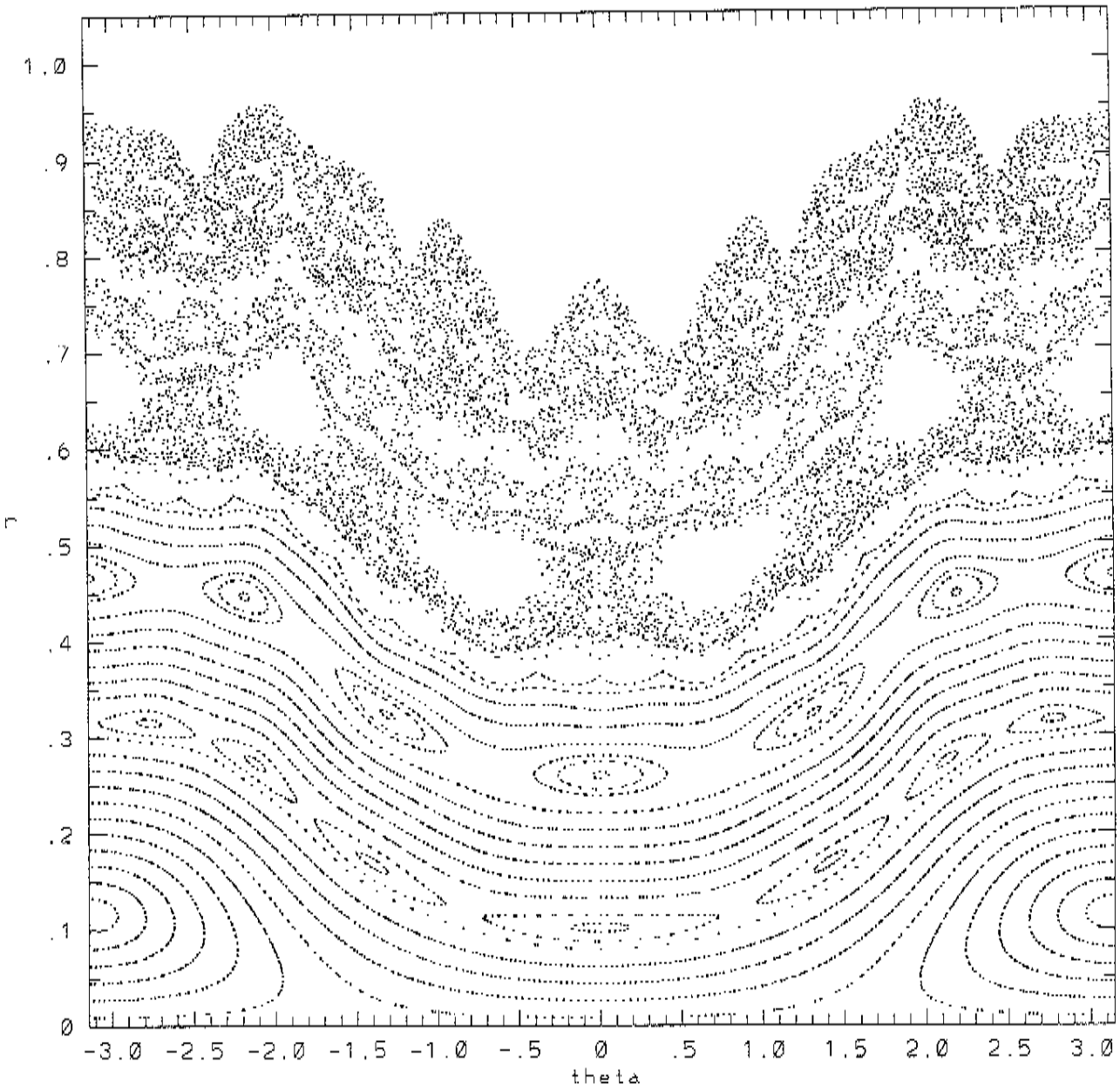
SAD 1



it=247 rpoinc: background coordinates

P383spnA Plot 551

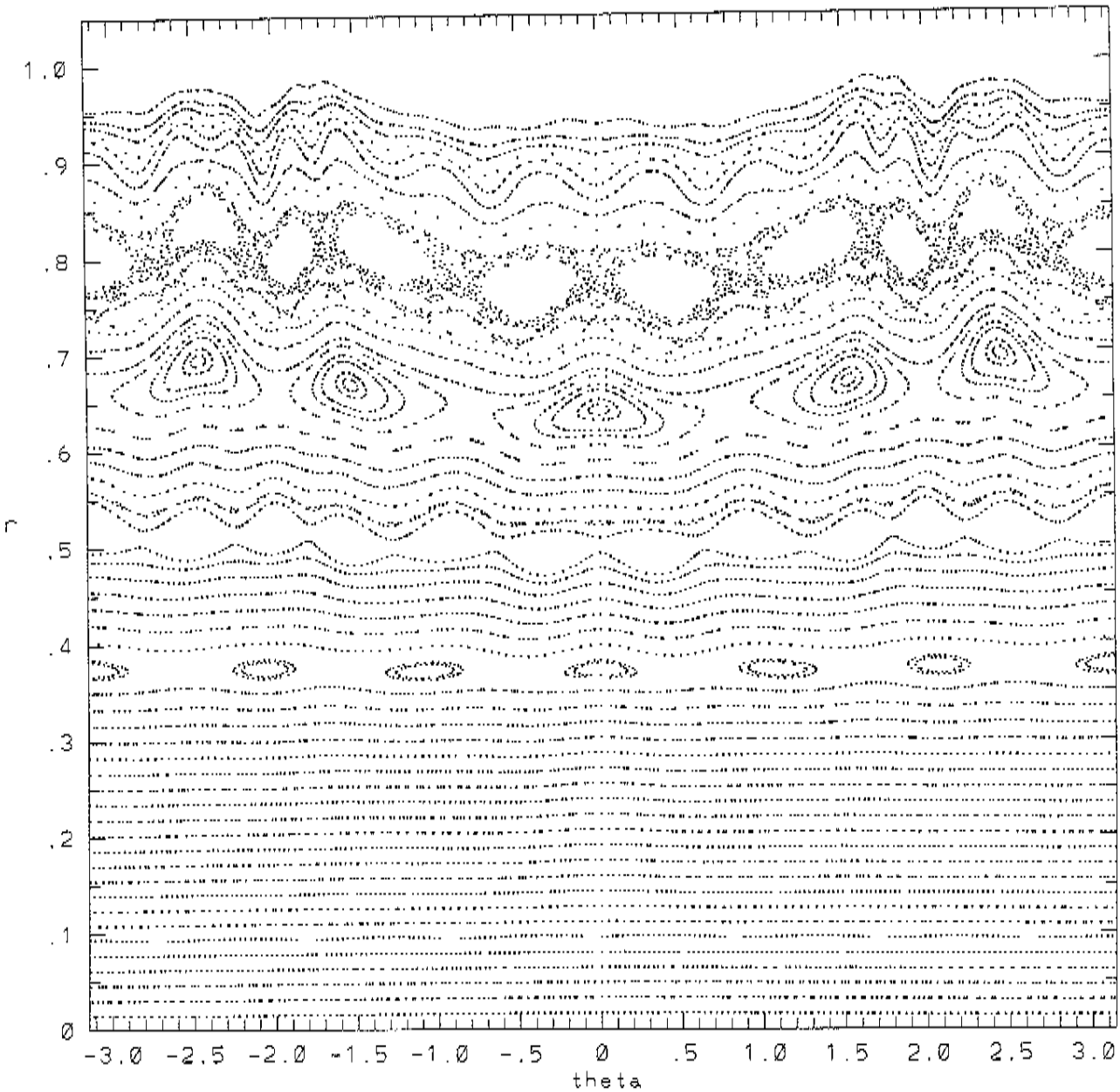
SAD 1 NO BLENDING



it=249 rpoinc: background coordinates

P383spAb Plot 23

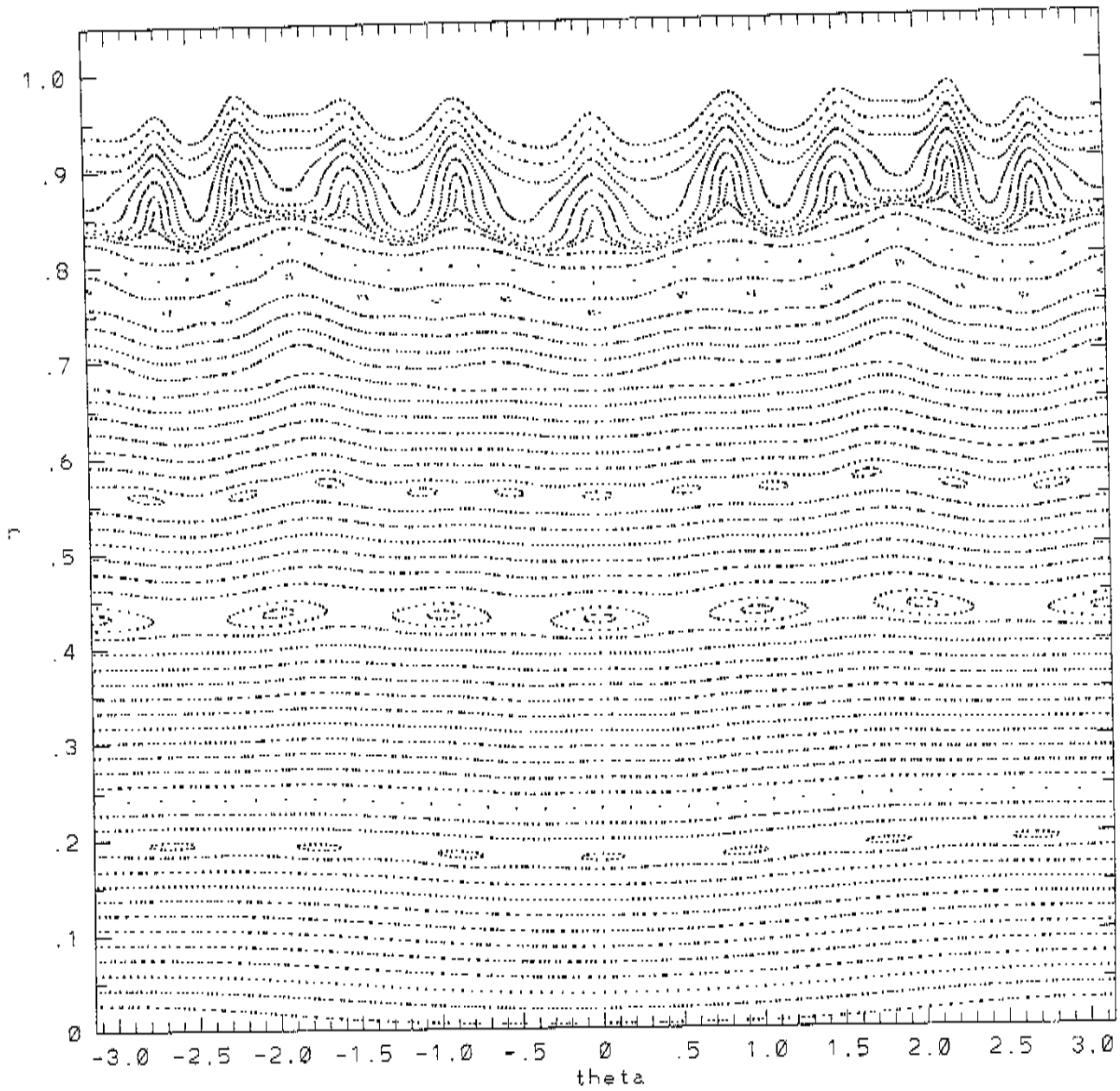
MOD 1



it= 90 rpoinc: background coordinates

p383way3 Plot 661

MOD 2

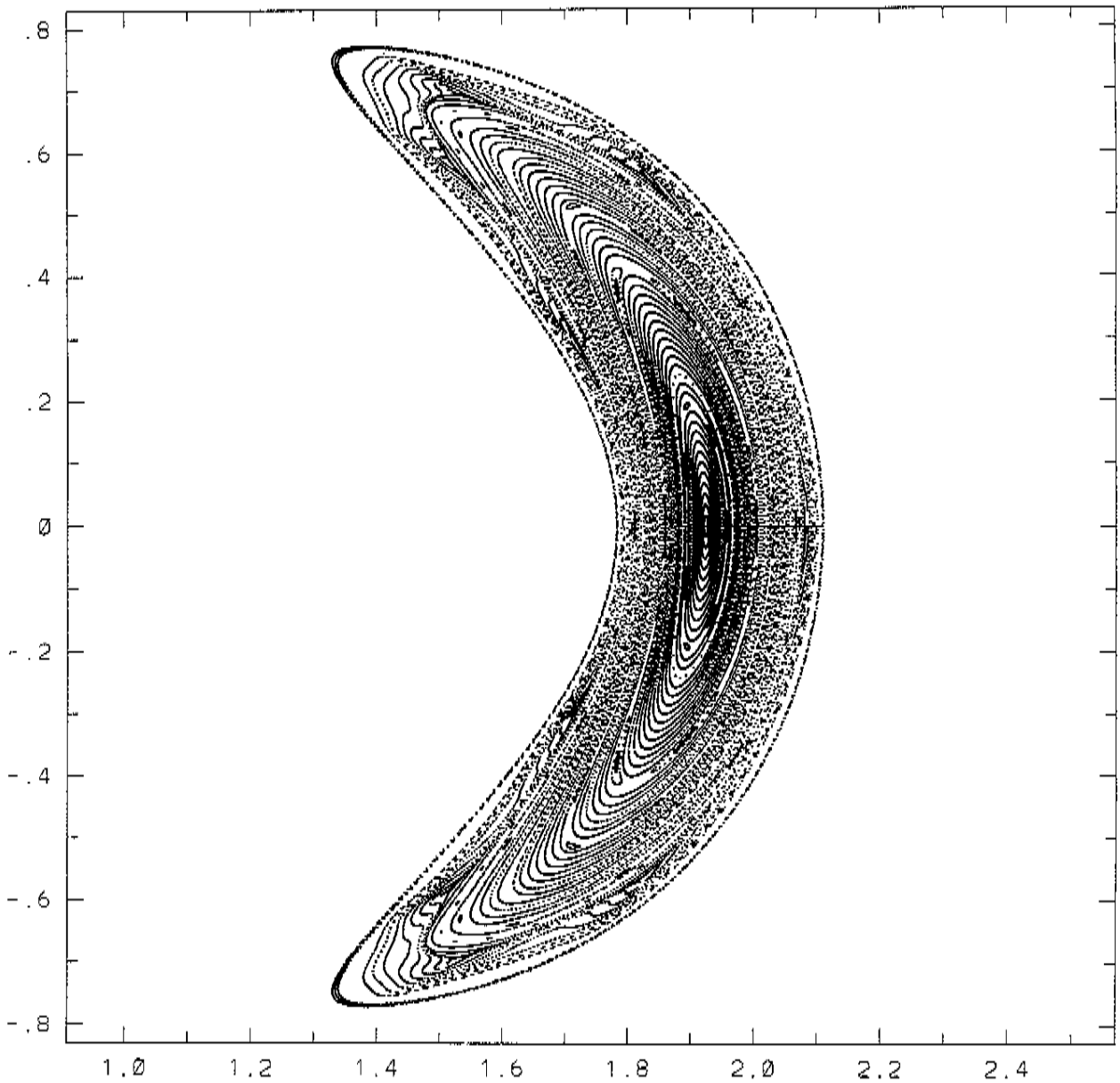


it=180 rpoinc: background coordinates

P383mdr6

Plot 639

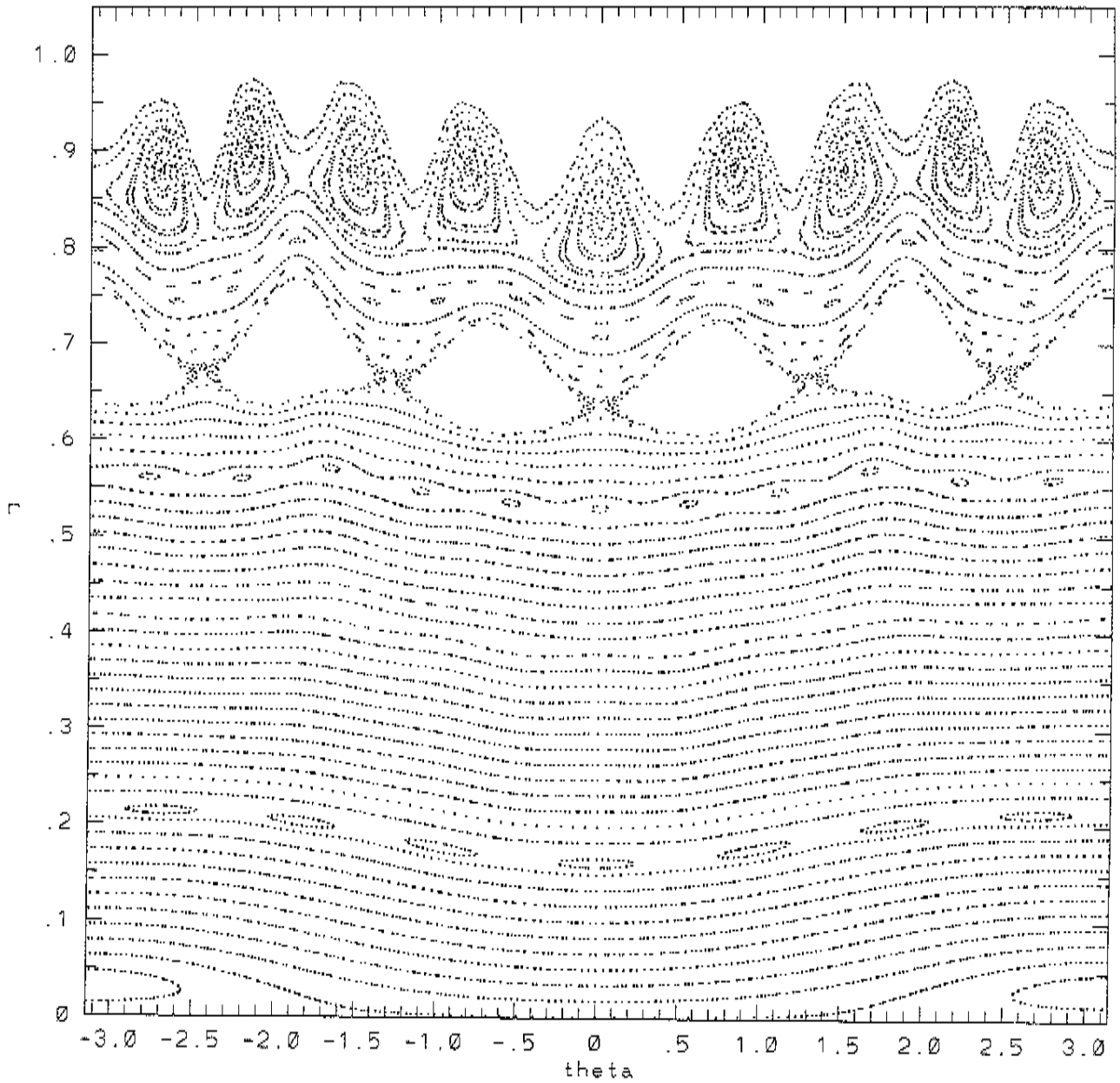
MOD 2



it=180 poincm: cartesian coordinates phi=0

P383mdr6 Plot 640

MOD 2 NO BLENDING

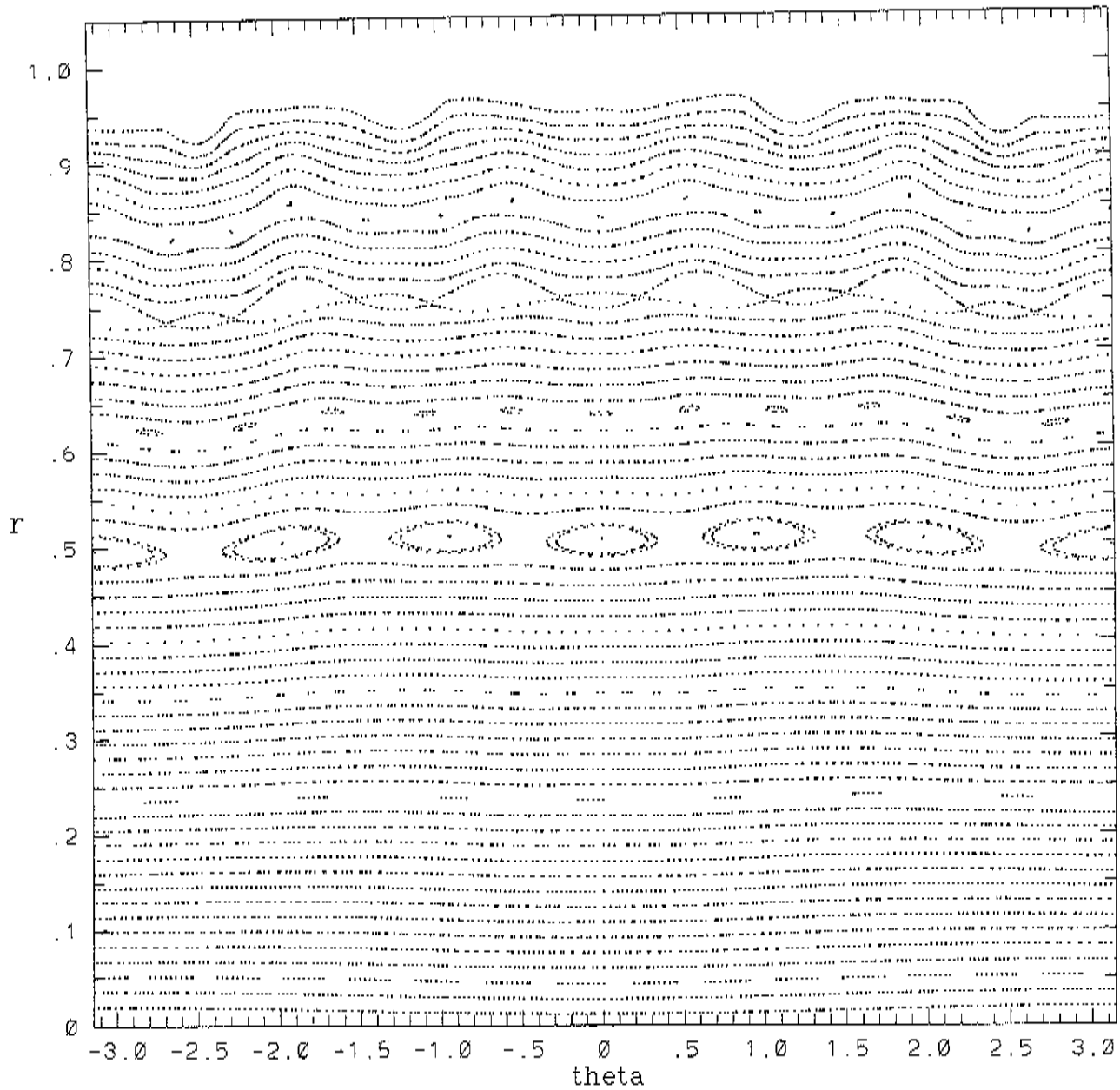


it=182 rpoinc: background coordinates

P383md6b

Plot 23

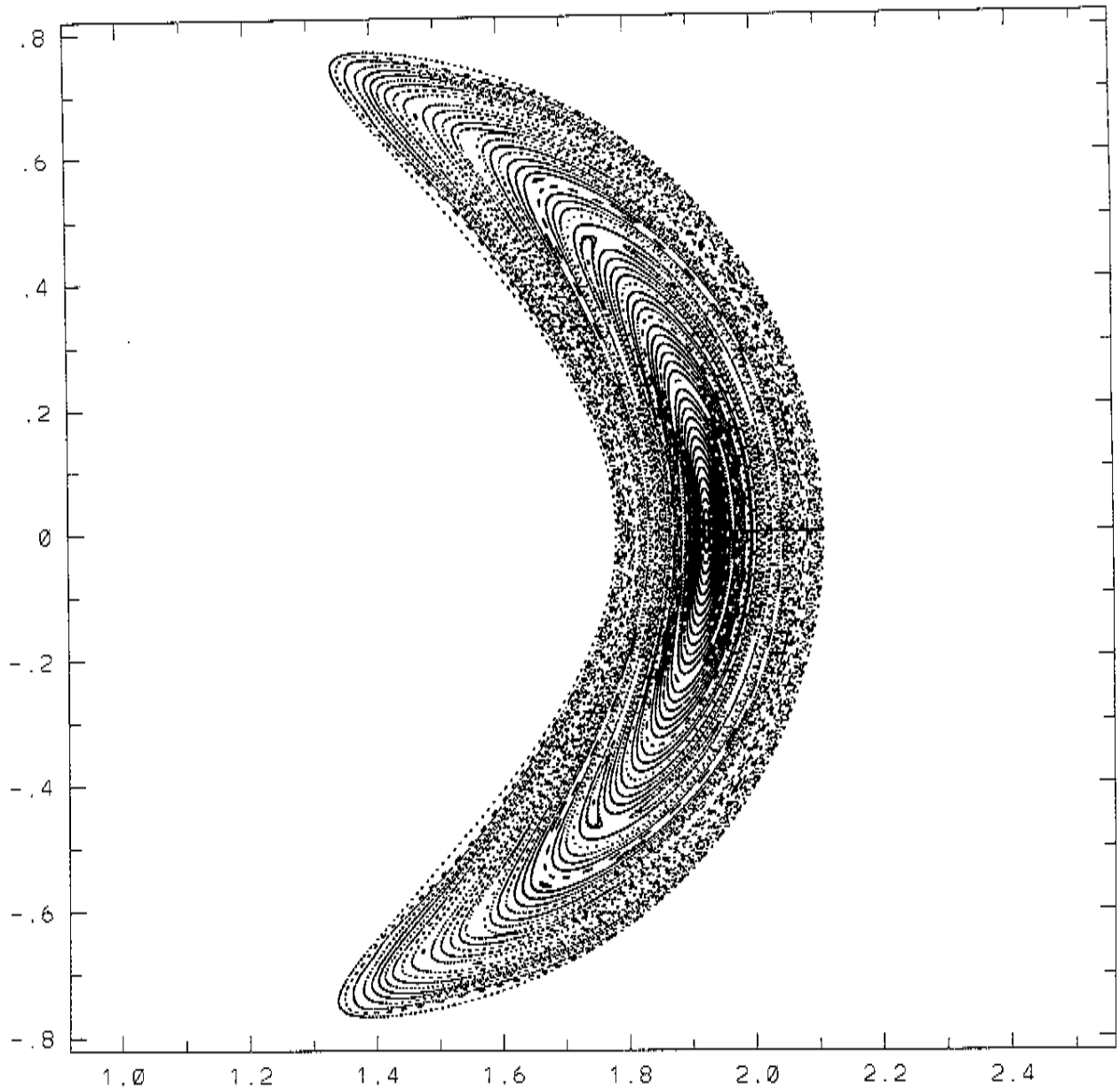
MOD 3



it=100 rpoinc: background coordinates

P383mdr2 Plot ***

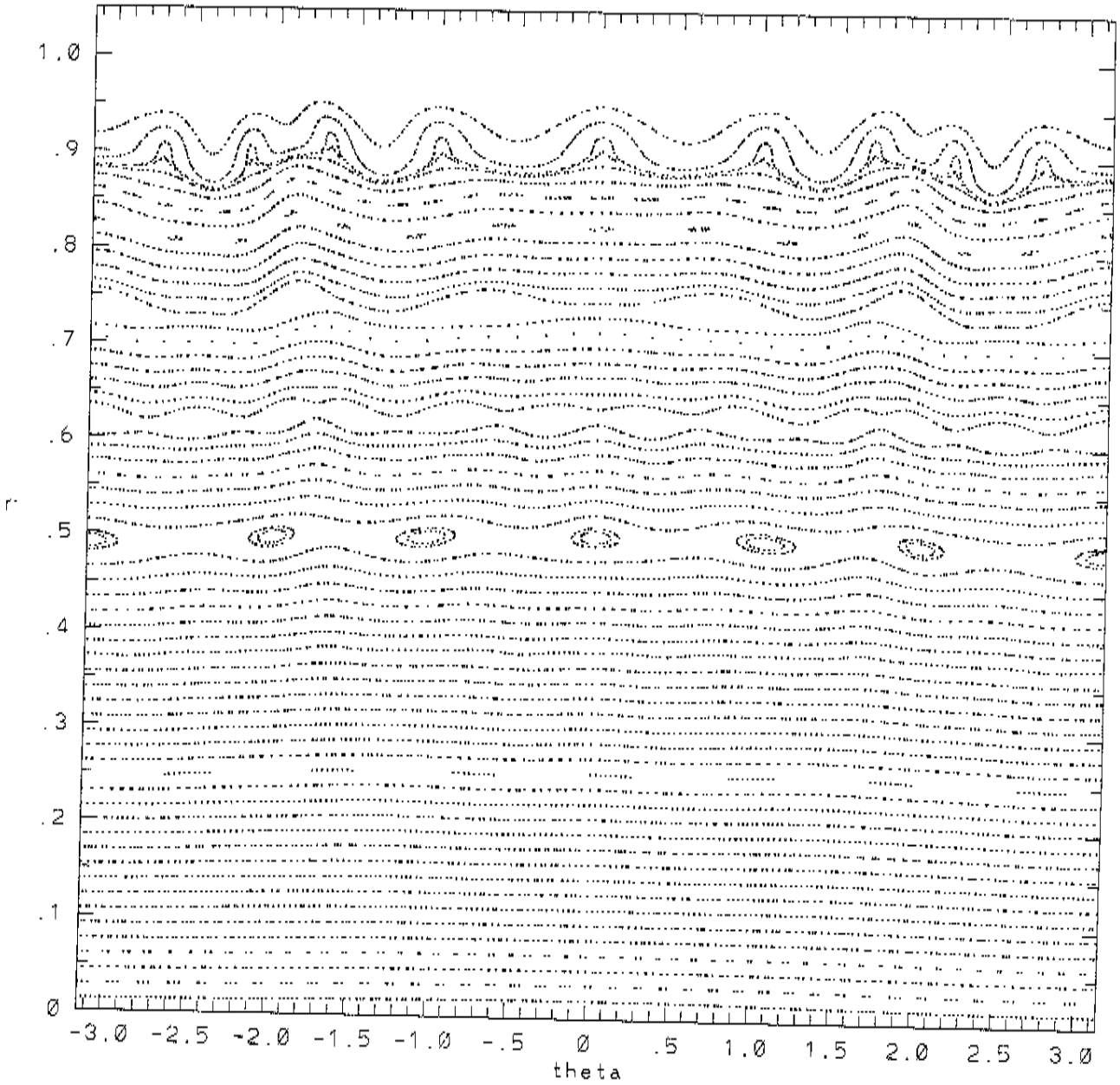
MOD3



it=100 poincm: cartesian coordinates phi=0

P383mdr2 Plot ***

SAD 2



it= 44 rpoinc: background coordinates

li383N_1

Plot 969

Pies Update:

Pies now runs on the local dec_alpha workstation in the free boundary mode. Speed is about 20% faster than seymour. Turnaround is about twice as fast as seymour.

Work is underway to get the splines working in the free boundary mode. This would give the workstations another factor of 2 over seymour.