PIES Code Update

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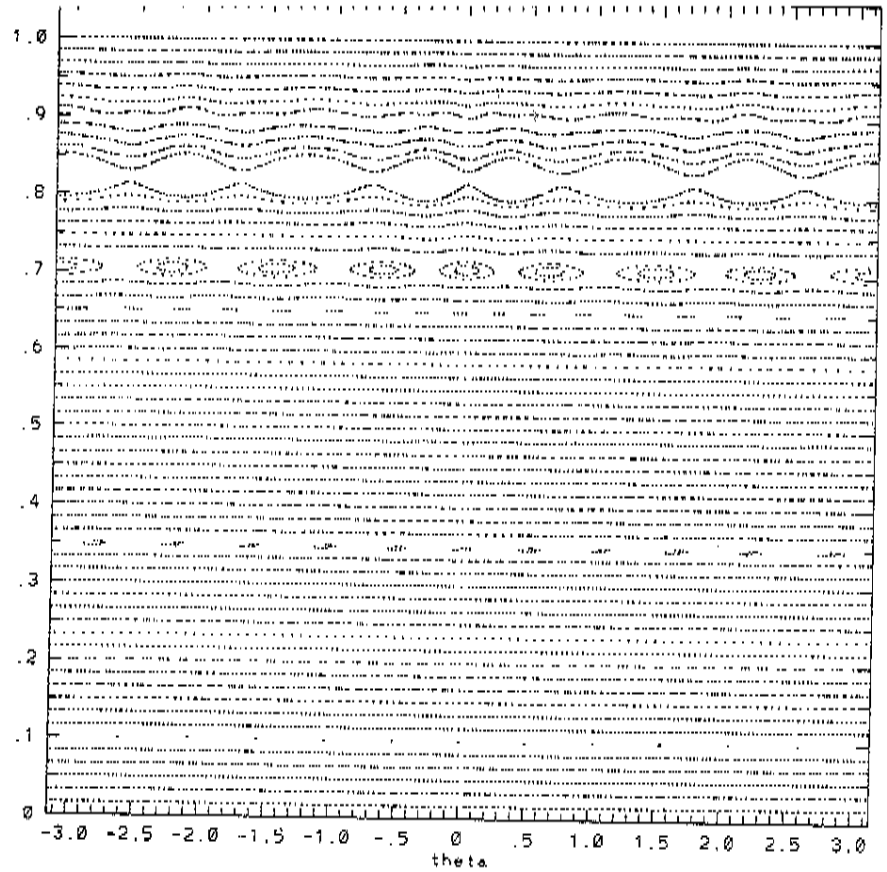
Outline

- Implemented disk based version of new Poisson solver
  - Reduced memory from 500 MW to 80 MW
  - Interactive run now possible on Seymour
- Debugged and checked out new treatment of out of phase islands, and bootstrap model
- Started debugging and checking out new free boundary algorithm
- Applied Pies code to various C82 snapshots
  - 0% beta, full current C82 snapshot
    - Treatment of out of phase islands
    - Bootstrap model
    - Free boundary
  - 1% beta, full current C82 snapshot
    - Bootstrap model
    - Phase reverse test
  - 3% beta, full current C82 snapshot
- Summary
- Future Plans



it= 80 rpoinc: background coordinates

c82c3_3a

Plot 697

ϕ% β

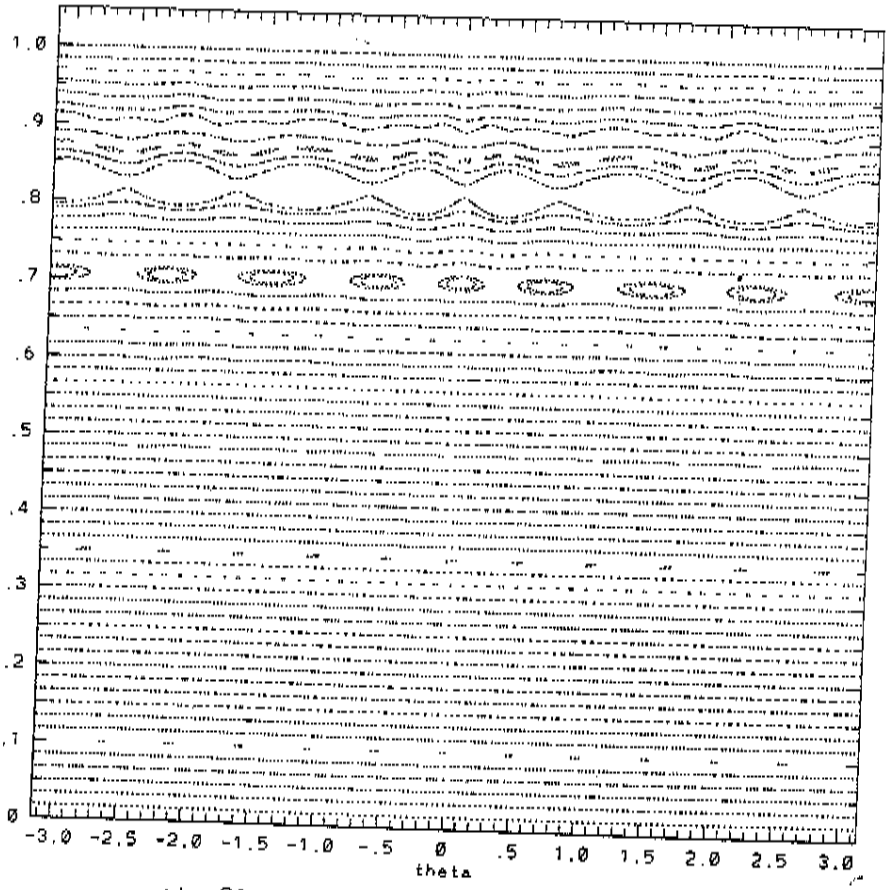
Full Current

C82

Fixed Boundary

New Out of phase

TREATMENT



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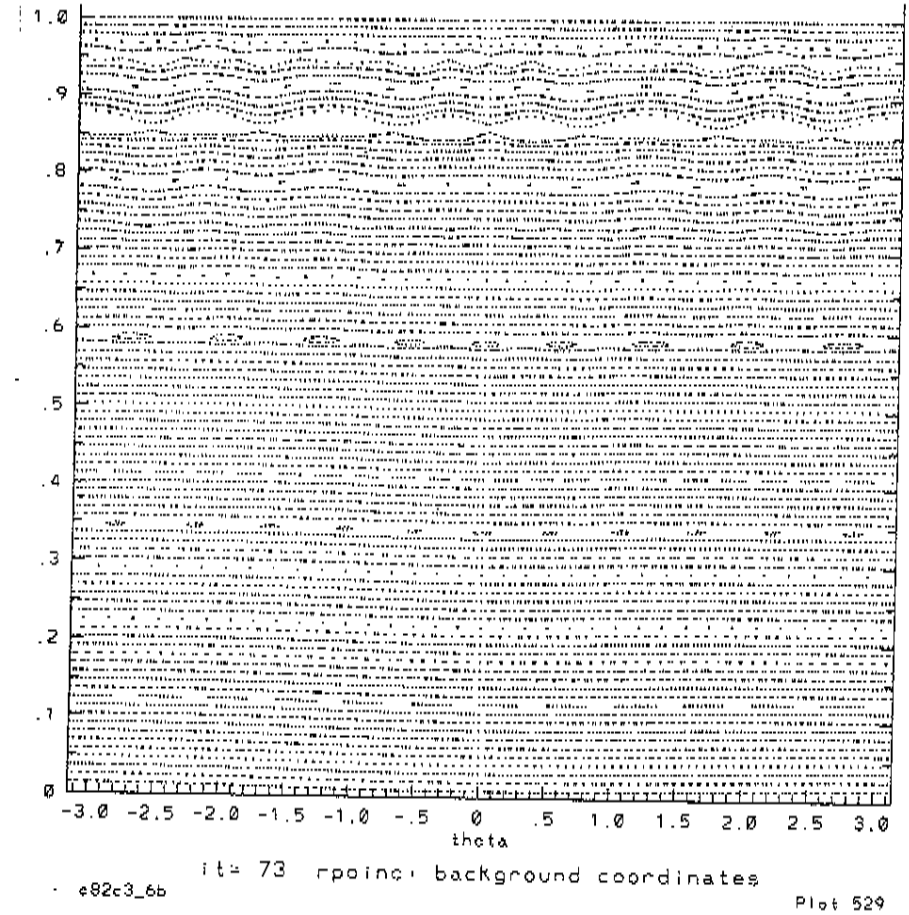
c82c3_3

Plot 1

OLD out of phase

TREATMENT

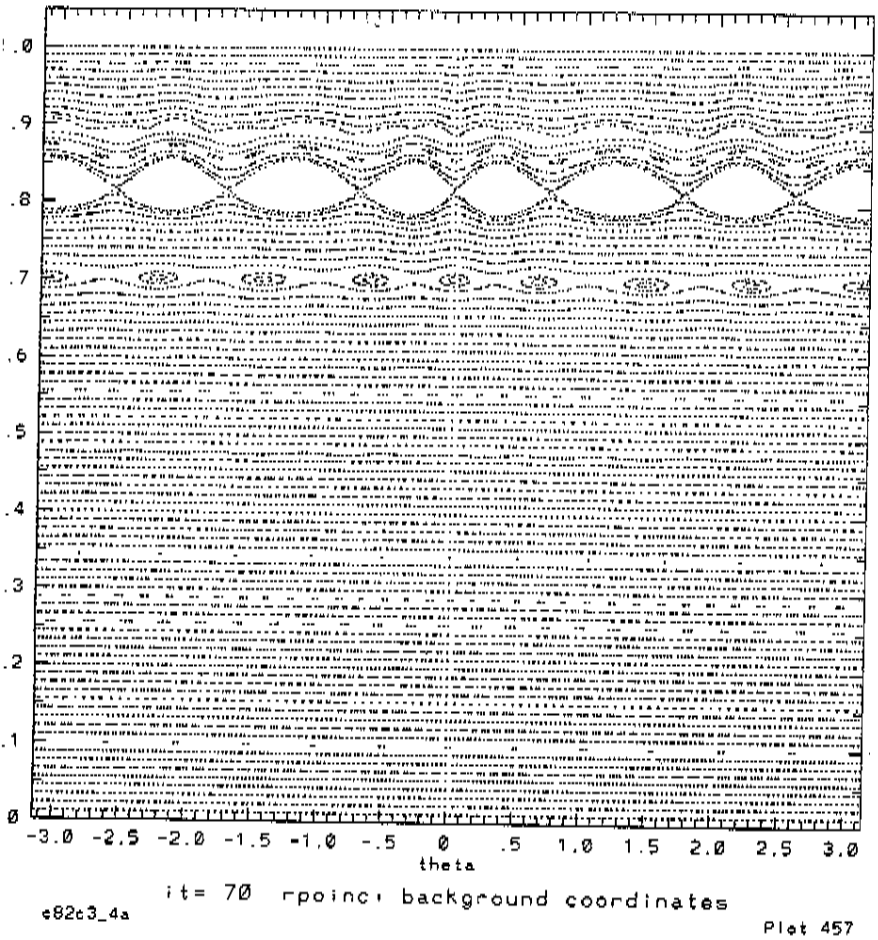


ϕ% β

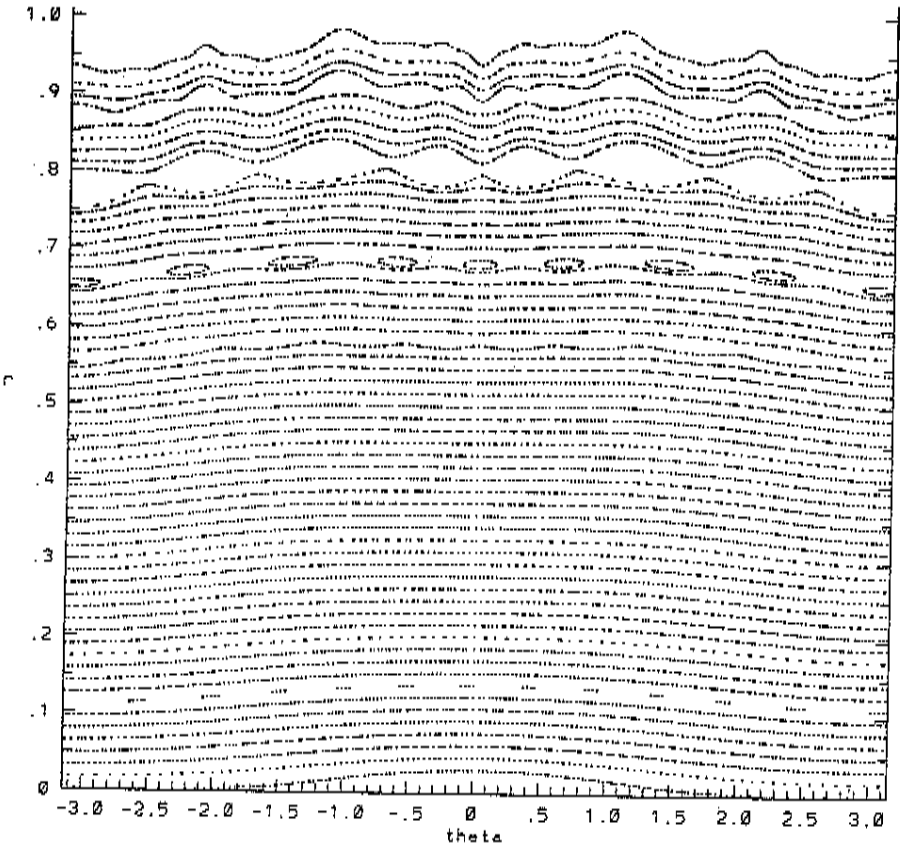
Full Current

C82

Bootstrap model on



Bootstrap model off



$\emptyset\%$ β

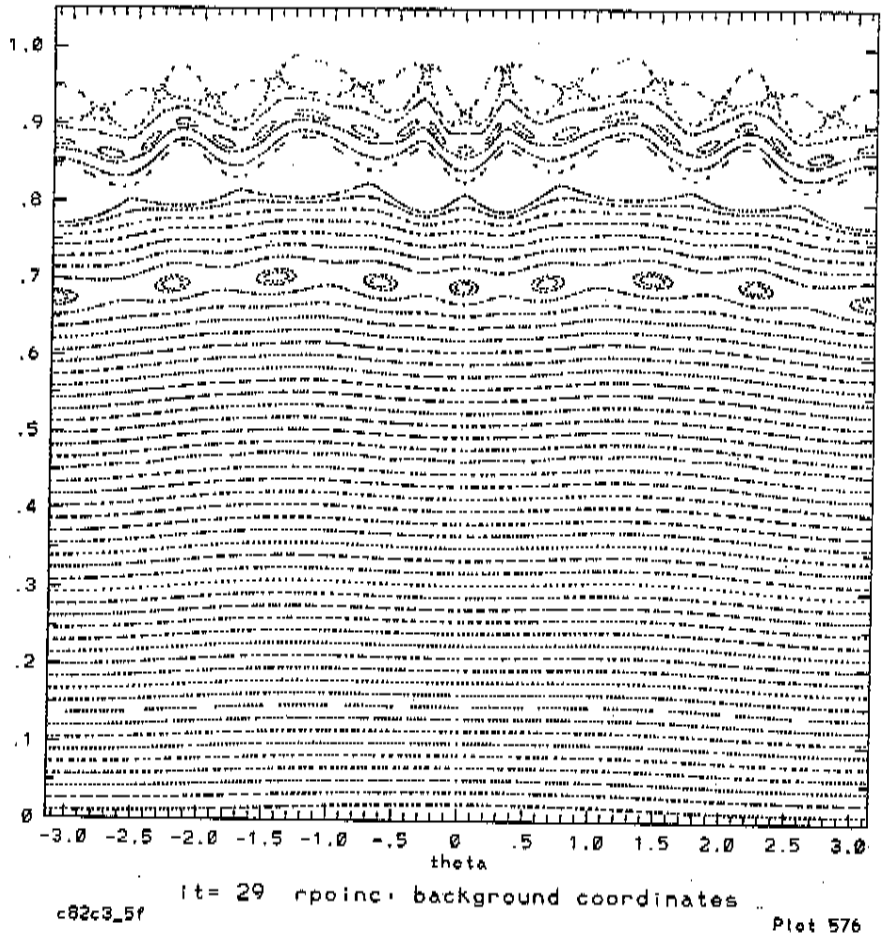
Full Current

C82

Free Boundary

Coils:

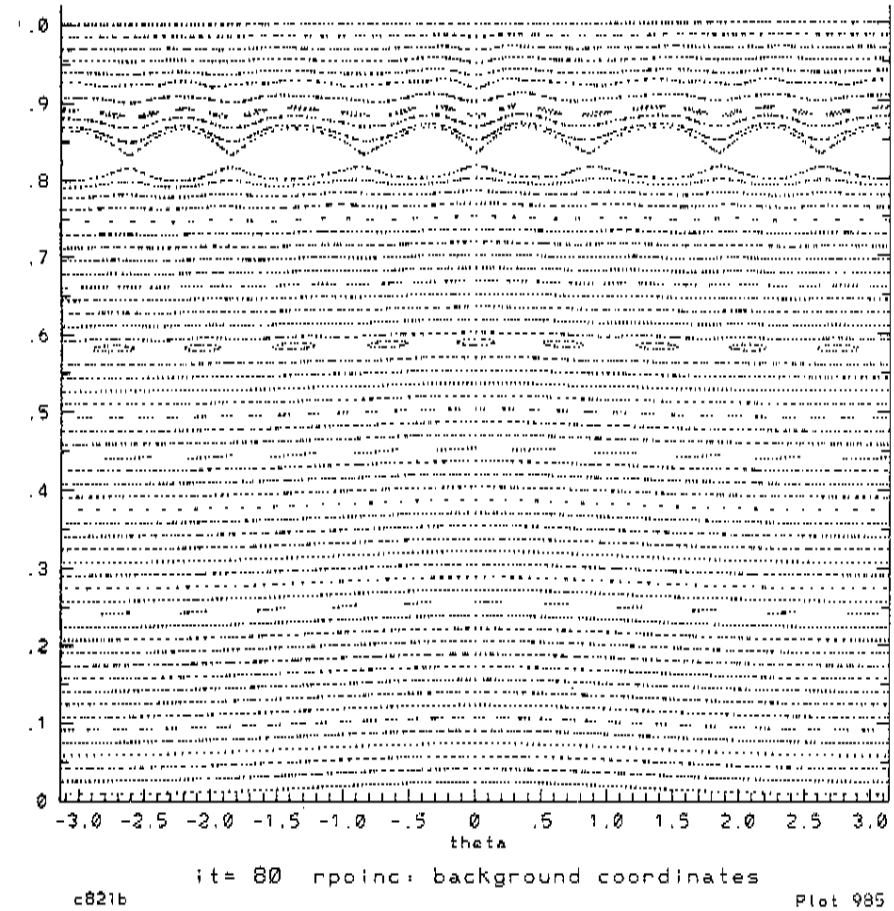
CASE 100



Free Boundary

Coils:

CASE 98



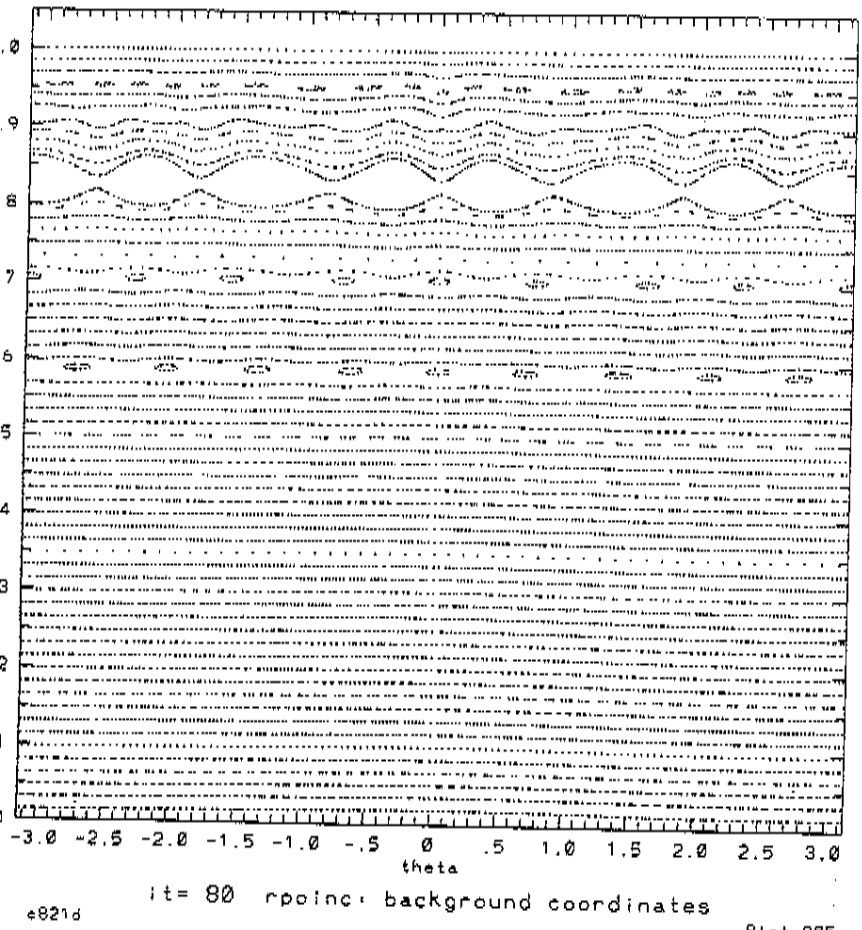
1% β

Full Current

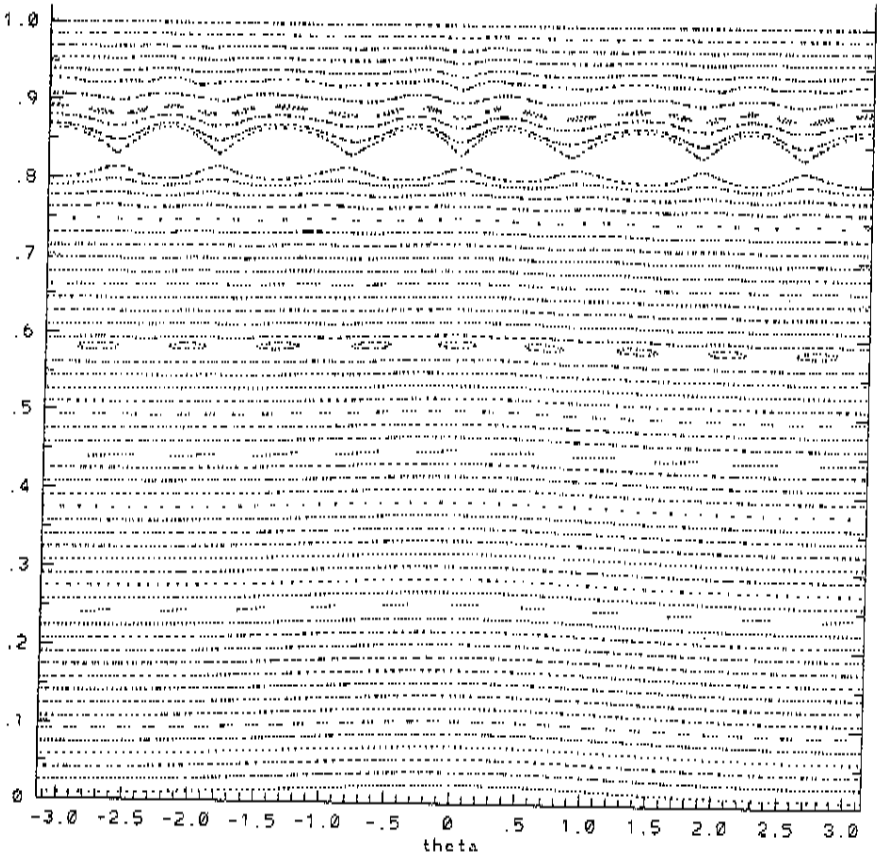
C82

Fixed Boundary

Bootstrap Model on



Bootstrap Model off



it= 80 rpoinc: background coordinates

c821b

Plot 985

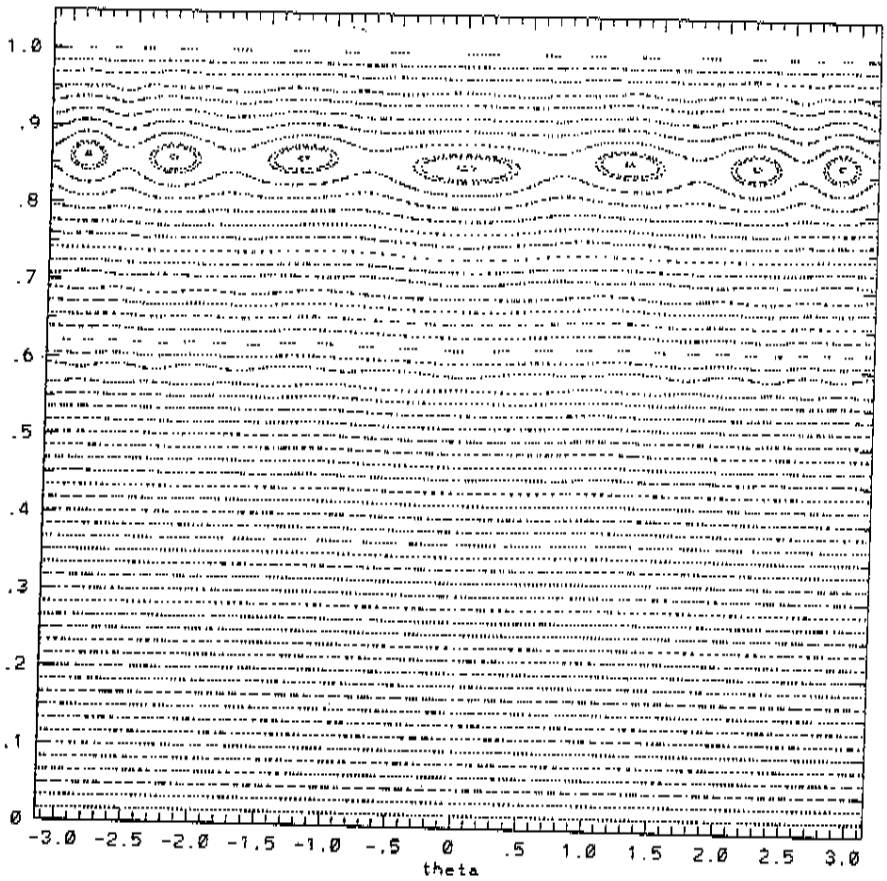
1% β

Full Current

C82

Fixed Boundary

Bootstrap Model on



it= 80 rpoinc: background coordinates

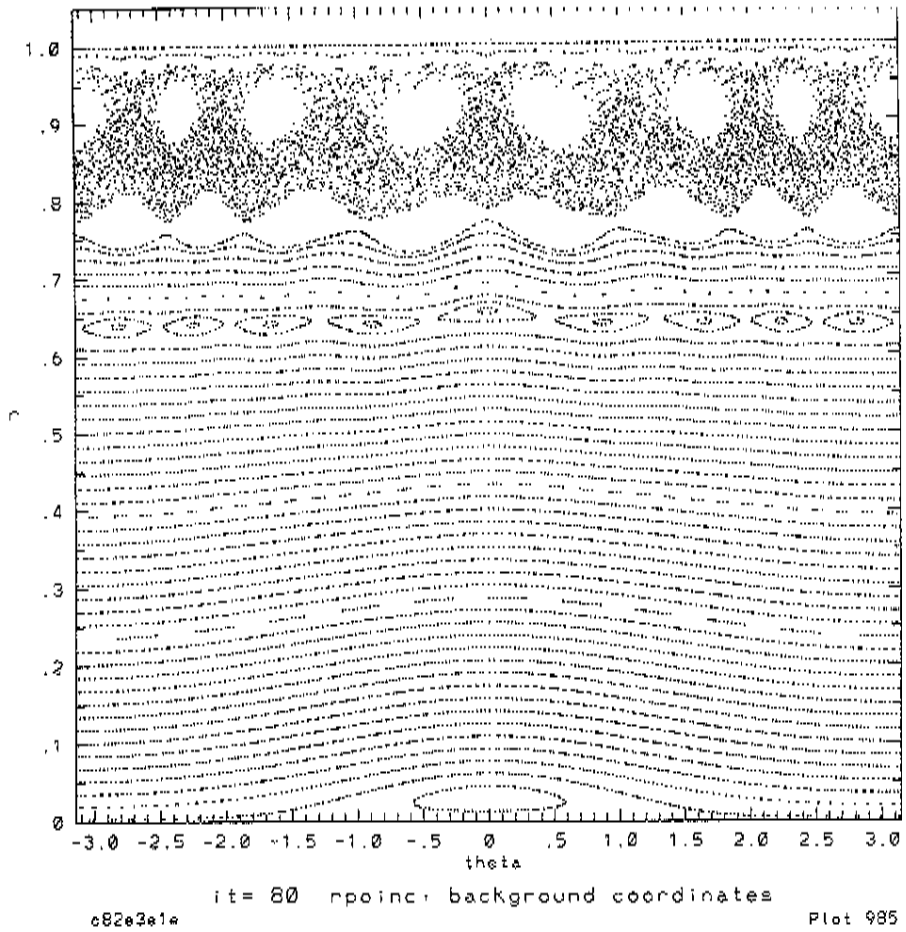
c821e

Plot 985

Bootstrap Model on

Phase of islands

Reversed

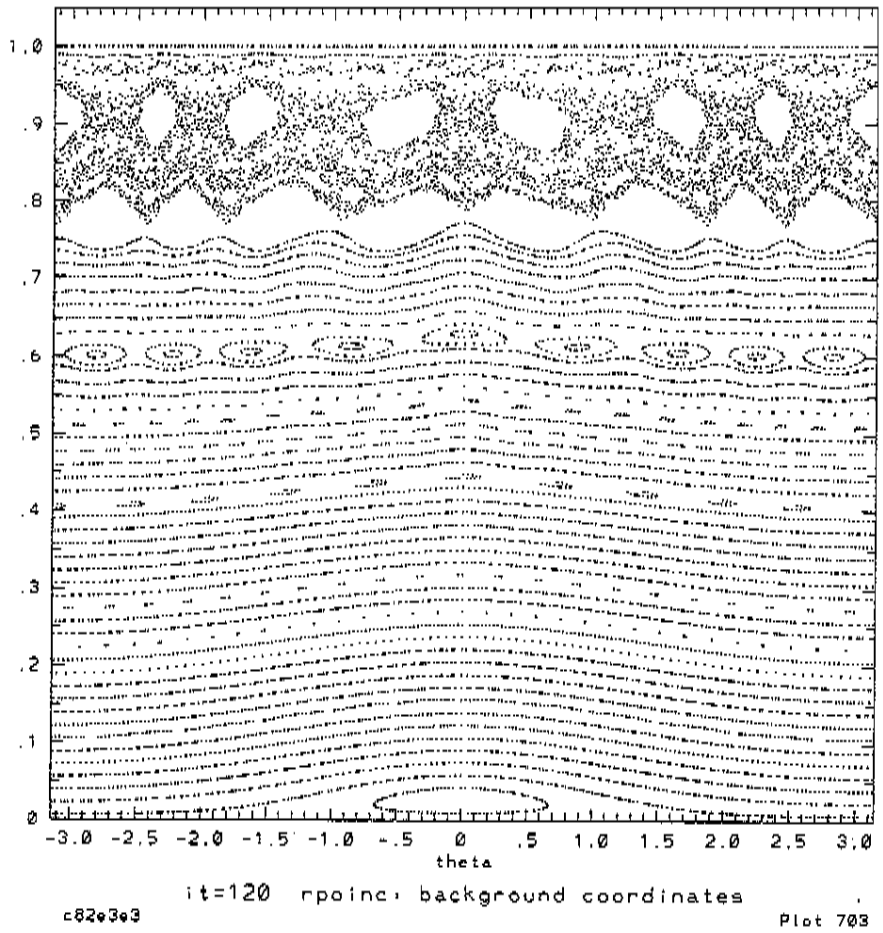


3% β

Full Current

C82

Bootstrap Model ON



Bootstrap Model off

- **Summary**
  - **Free boundary and new out of phase treatment appear to be working properly.**
  - **Present bootstrap model does not have a significant effect on island size for cases with pressure driven islands.**
  - **C82 appears to be problematic for betas of the order of 3%**

- **Future Plans**
  - **Do more checking of the present bootstrap model**
  - **Consider improvements to the present bootstrap model**
  - **Continue checking free boundary code**
  - **Consider other configurations**
  - **Consider boundary modifications to oppose the pressure driven 7/3**
  - **Consider optimizing for zero resonant Jacobian**