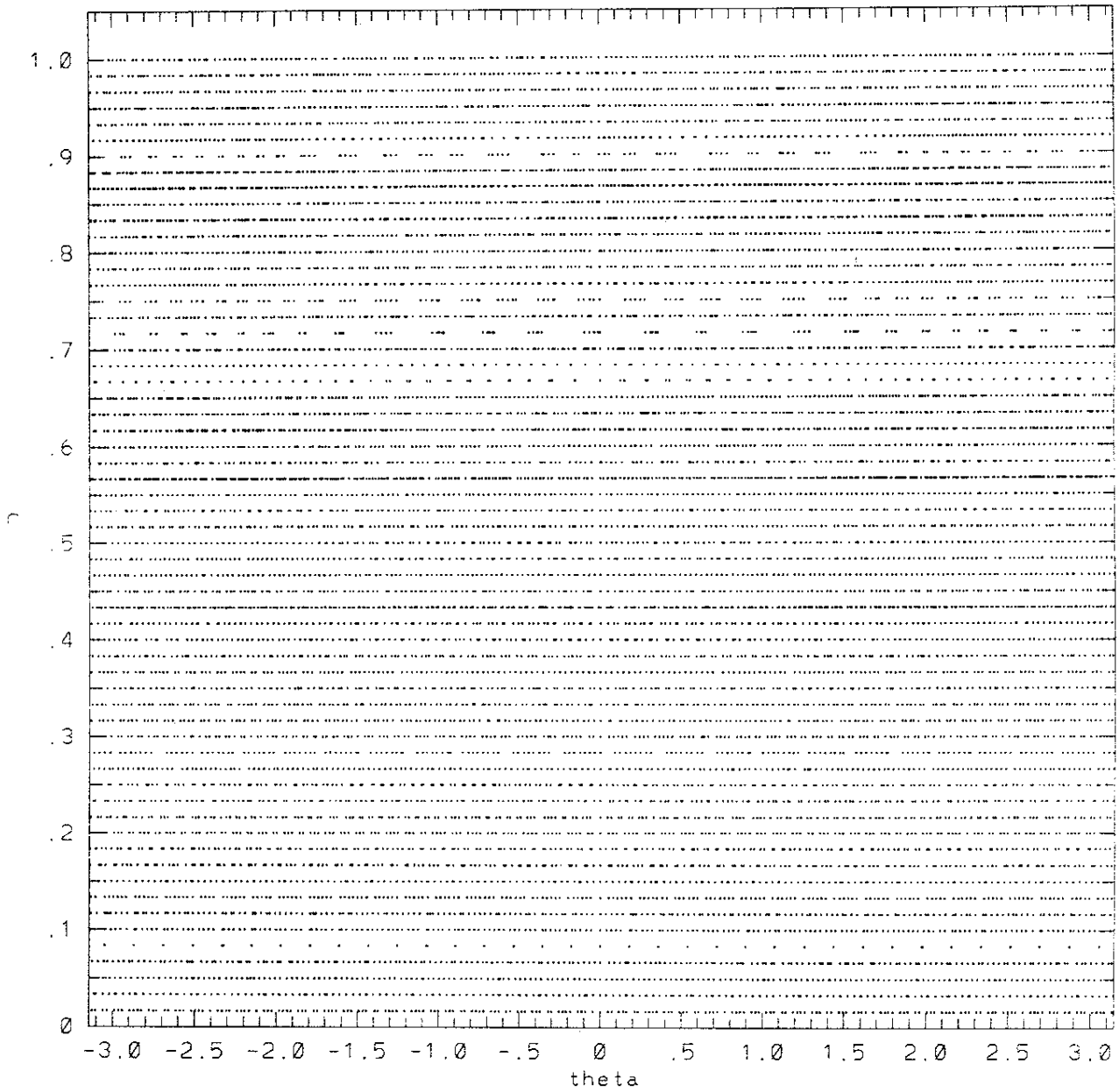
MONTICELLO

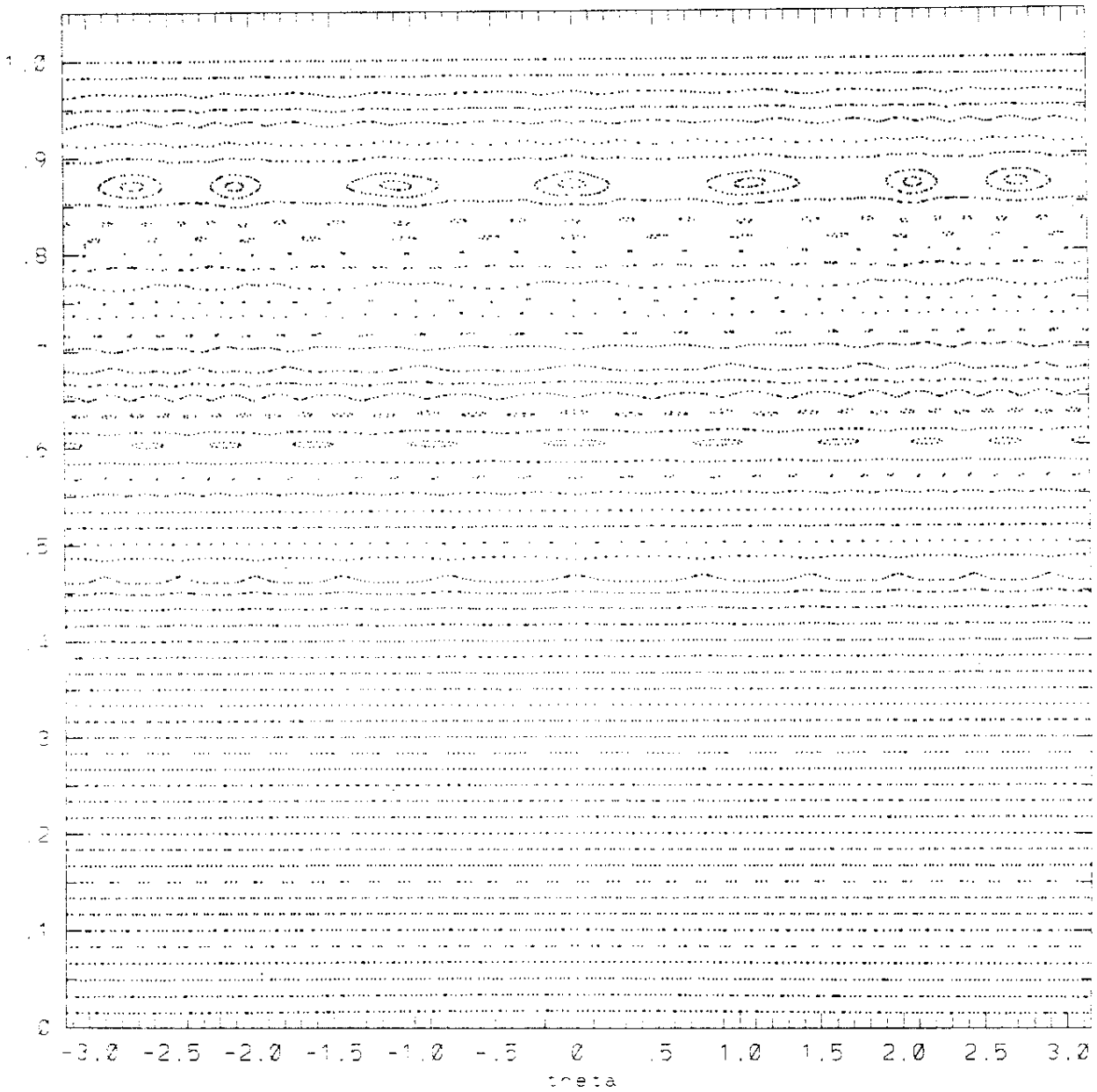
1



it= 0 rpoinc: background coordinates

Plot 1

MONTICELLO
2



it= 1 mpoint: background coordinates

Plot 74

MONTICRILLO
3

Cary-Hanson Minimization of Islands for Configurations with Plasma Current

1) Present method to select coil currents

$$[B\cdot n(\rho=1)]_{m,n} = M_{m,n,k} I_k$$

MINIMIZE

$$\sum_{m,n}' [B\cdot n(\rho=1)]^2_{m,n}$$

USING SVD

2) Shortly we will use weight functions provided by the Texas Group

MINIMIZE

$$\sum_{m,n}' [B\cdot n(\rho=1)]^2_{m,n}\, \omega_{m,n}$$

WHERE

$$\omega_{m,n} \sim \frac{1}{\iota m + n}$$

MONTICELLO
4

3) To effect the Cary-Hanson island minimization we propose the following

MINIMIZE

$$\sum_{m,n}' \left[B\cdot n(\rho=1) \right]^2_{m,n} \omega_{m,n}$$

$$+ \sum_{t}' \left[B\cdot n(\rho=\rho_t) \right]^2_{m(t),n(t)} \omega_{m(t),n(t)}$$

WHERE t IS AN INDEX TARGETING A PARTICULAR SURFACE, ρ_t, AND FOURIER MODES $m(t), n(t)$

FOR EXAMPLE: $\rho_t = .87$, $m(t), n(t) = 7, 1$

NOTE: $B = B_p + B_c$

B_p = B field due to plasma currents

B_c = " " " " COIL "

RIGHT NOW $B_p(\rho=1)$ IS PROVIDED BY VMEC USING A CODE WRITTEN BY PETER MERKEL

$B_p(\rho=\rho_t)$ COULD BE PROVIDED BY MODIFICATION OF SAME CODE OR BY PIES CODE