

Results of off-center harmonics measurements and analysis.

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In the FMI lattice at Q402, Q522 and Q620 we will introduce a displacement in the closed orbit of the circulating beam to clear the extraction elements.

This is accomplished by ~~the~~ displacing quadrupoles at these locations by a few mm.

The closed orbit of the circulating beam is ~~at~~ at 15 mm, 23 mm and 23 mm at the above locations with respect to the "theoretical" closed orbit.

We need to know the quadrupole field and multipoles at these locations.

We have measured Quadrupole BQAΦ19
at 5 currents

217, 500, 1575, 2900 and 3630 Amps

The probe was centered at

$$X = 0$$

$$X = -0.2, -0.4, -0.6 \text{ inch}$$

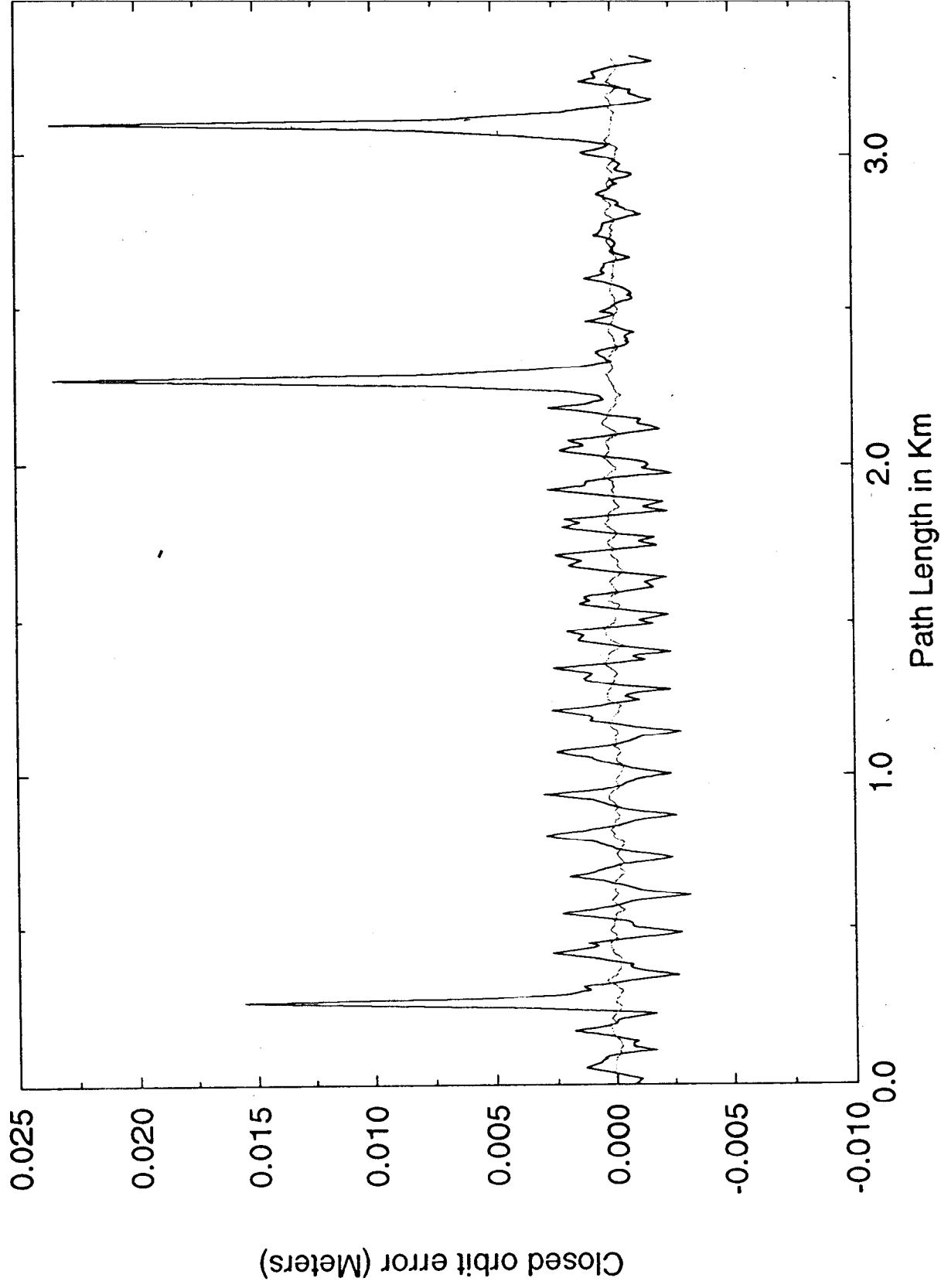
$$X = 0.2, 0.4, 0.6 \text{ inch}$$

The data is stored in sybase.

Using H. Glass's reports and analysis
program this data has been analysed.

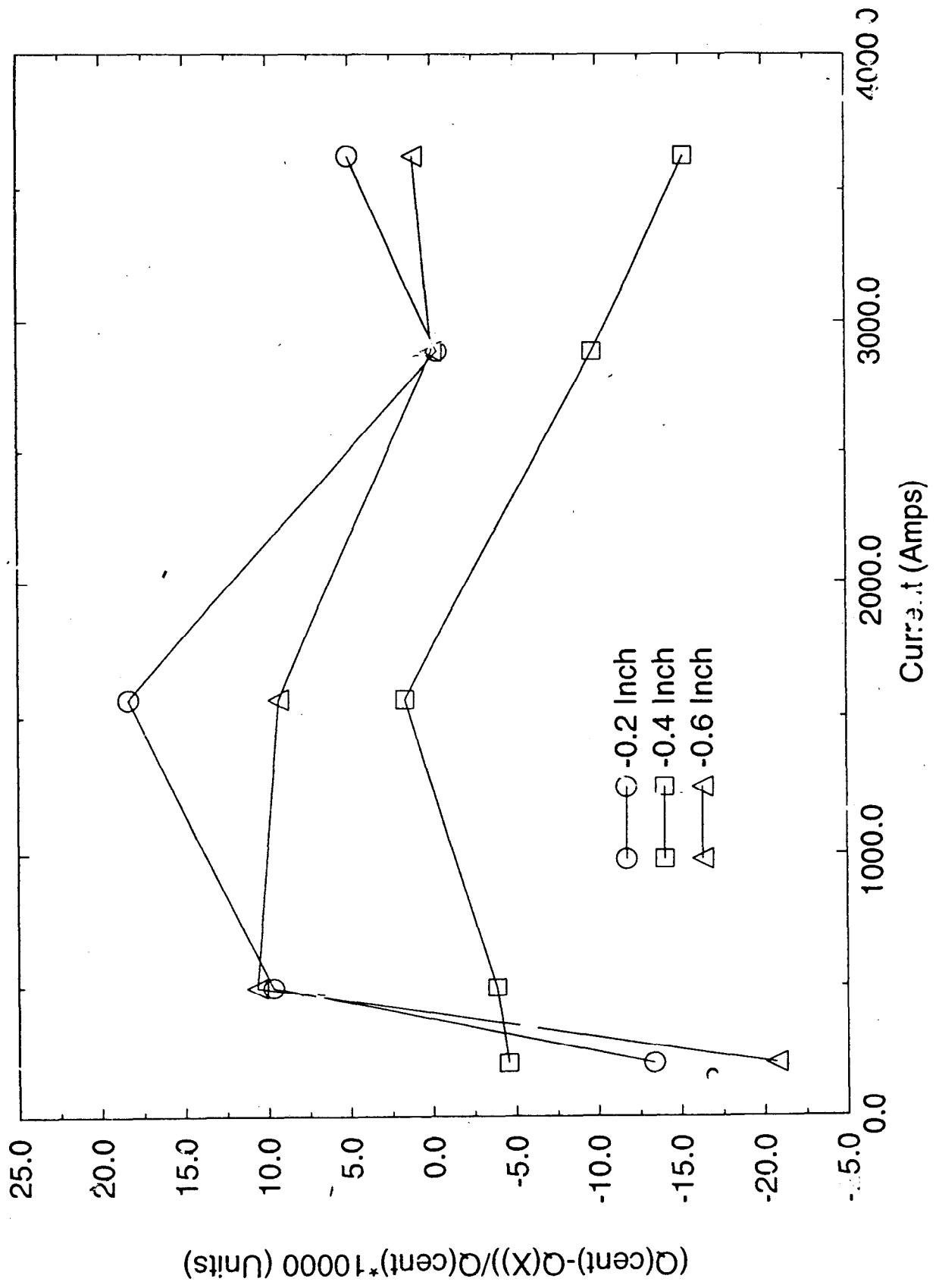
Closed Orbit error with three local bumps

F Quad displaced at Q340-Q406, Q518-Q526, and Q618-Q622



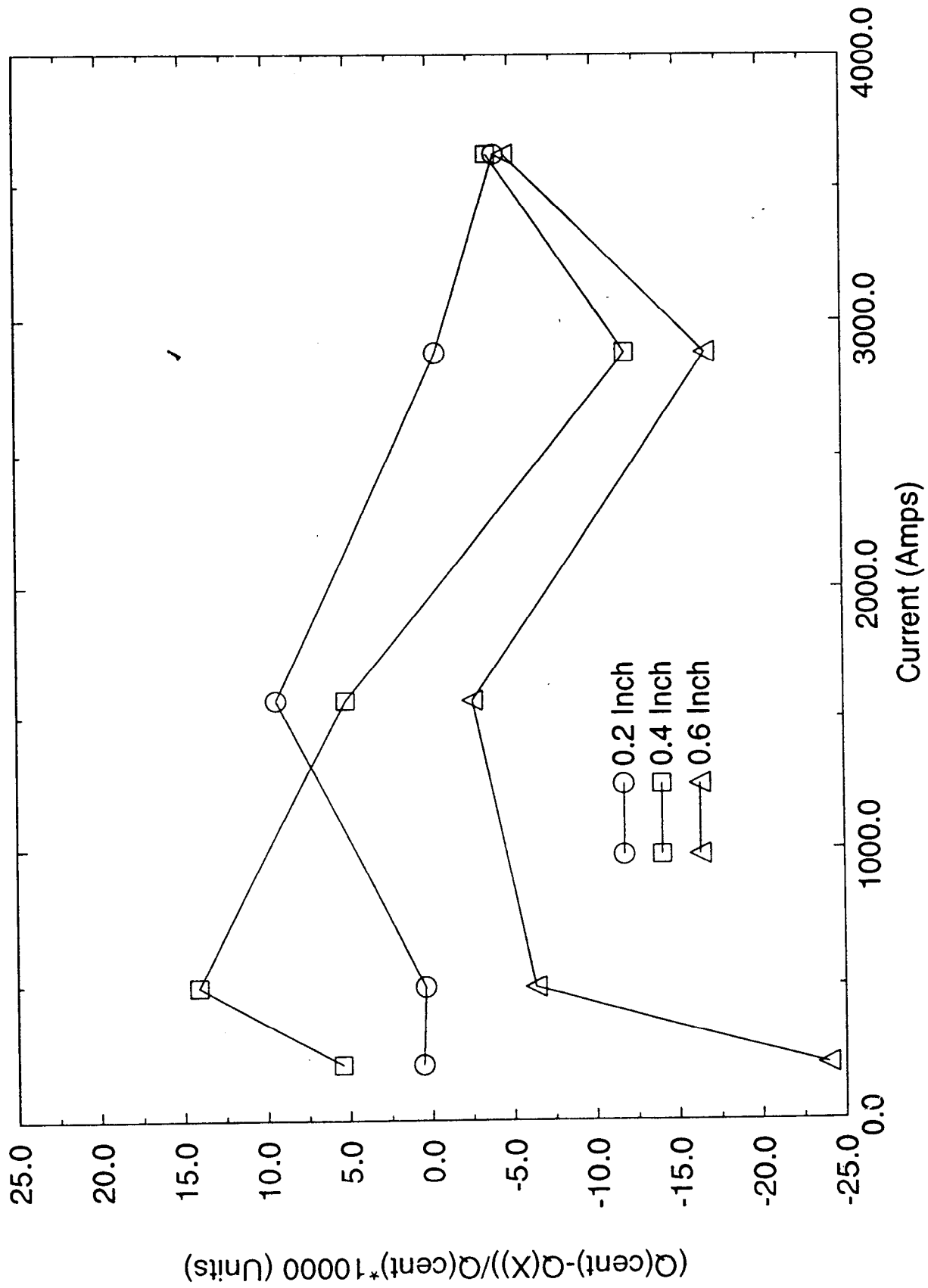
Change in Quadrupole Strength

At different X locations



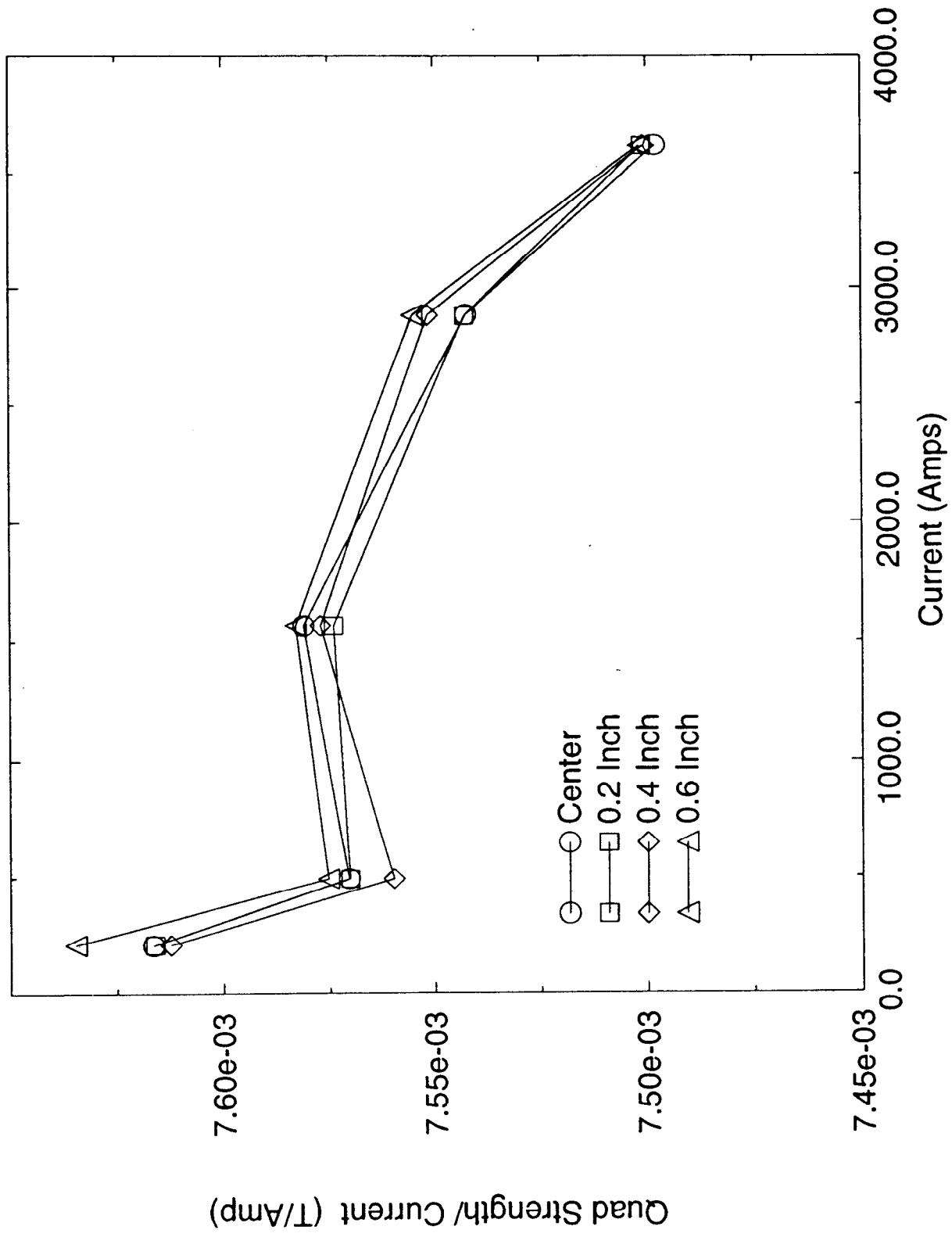
Change in Quadrupole Strength

At different X locations



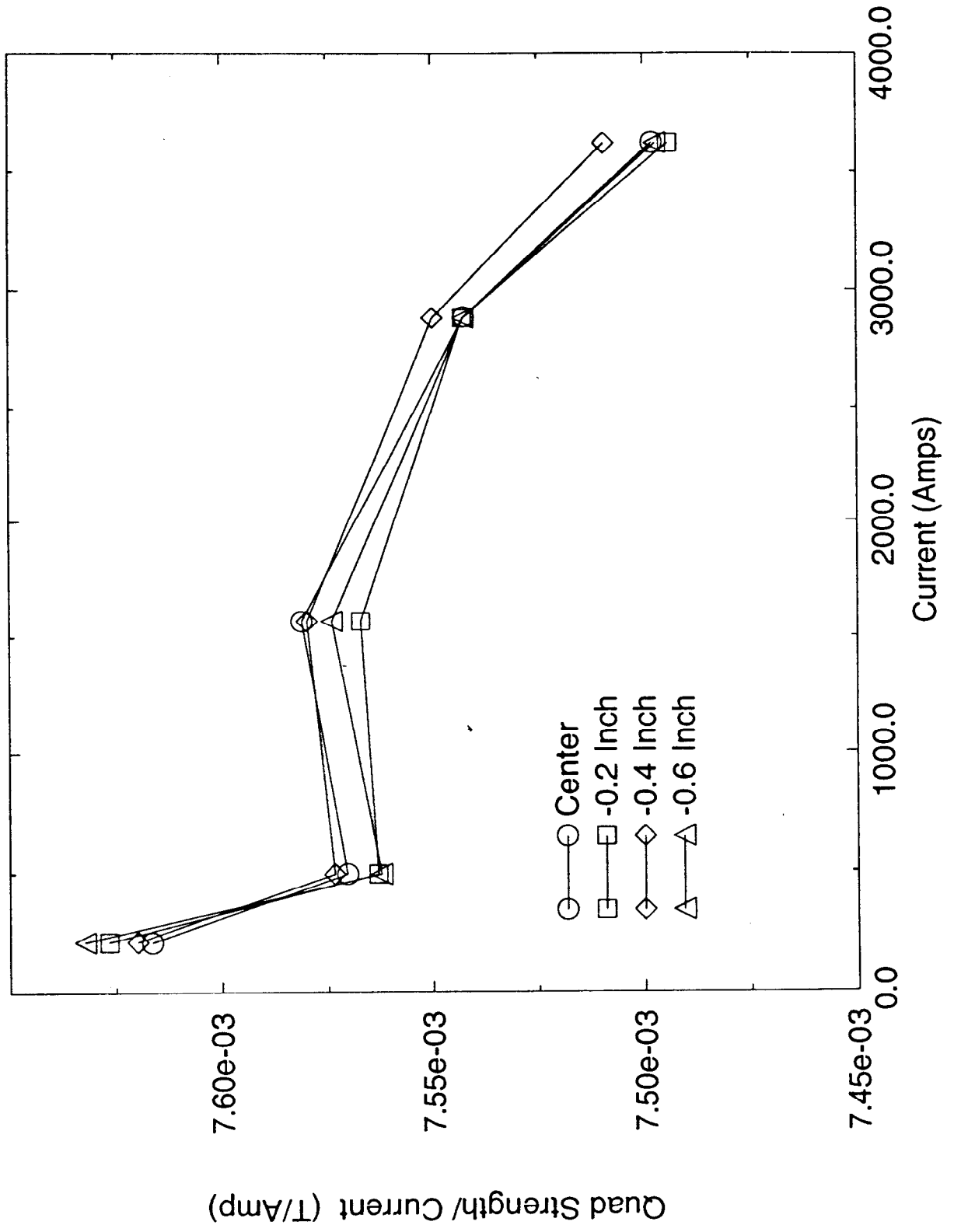
Quadrupole Strength

As a function of X position



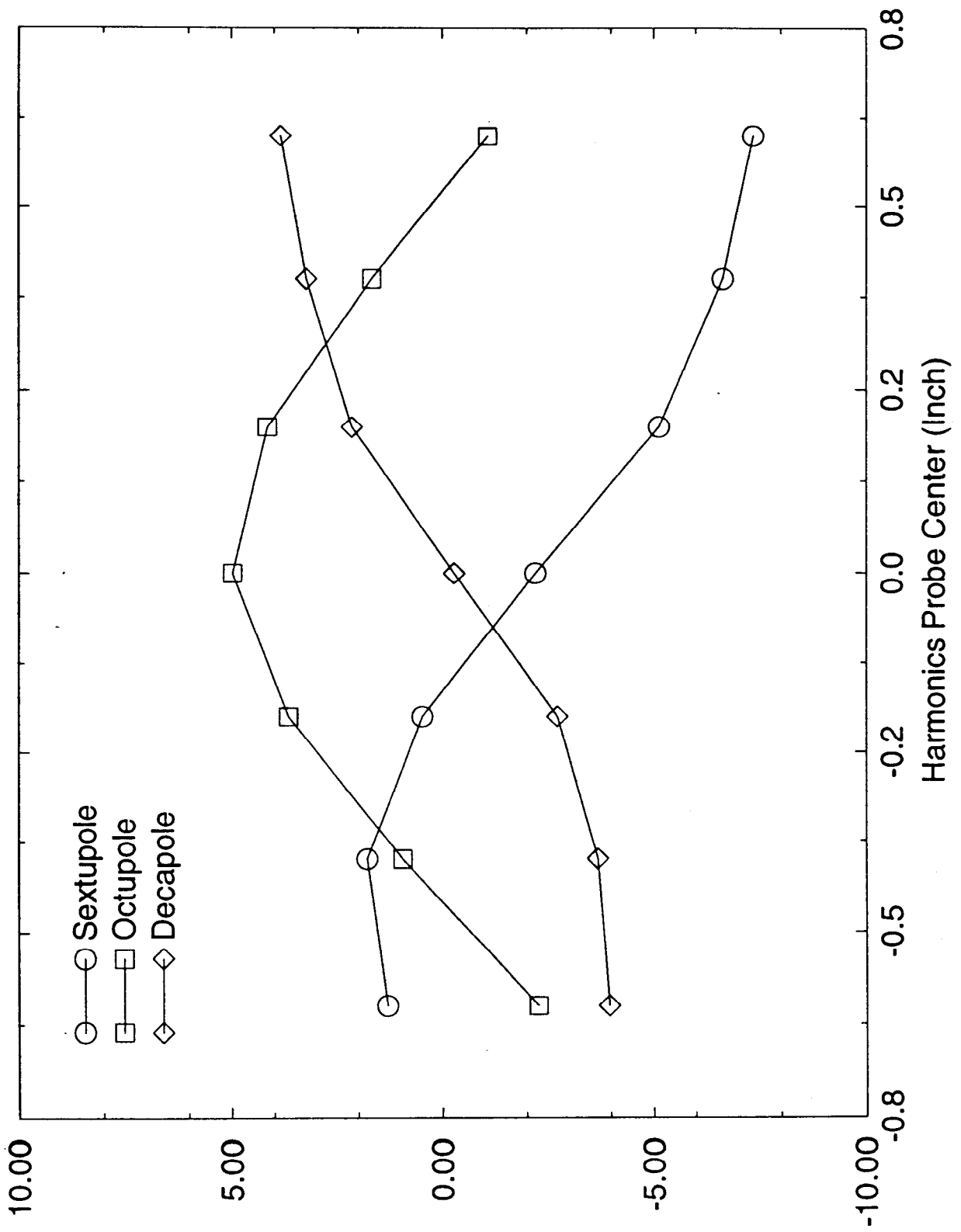
Quadrupole Strength

As a function of X position



Quadrupole Multipole as a function of x

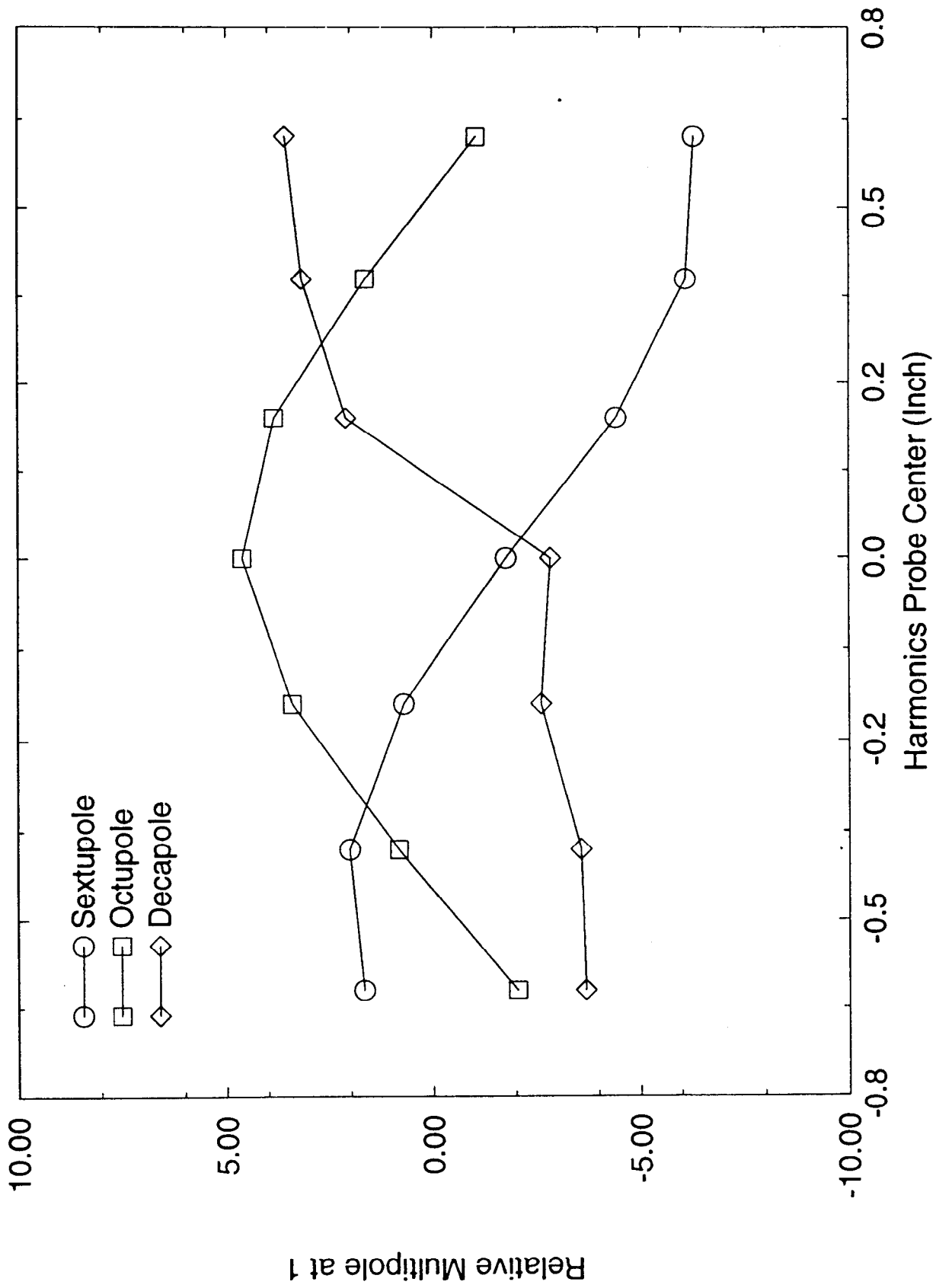
Current = 217 Amps (injection)



Relative Multipole at 1 (Units)

Quadrupole Multipole as a function of x

Current = 2900 Amps (Slow Extraction)



Quadrupole Multipole as a function of x

Current = 1575 Amps

