national accelerator laboratory

EXP-48

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ACCELERATOR EXPERIMENT--Measurement of the Driving Term for the $2\nu_y + \nu_x = 60$ Resonance

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It has been known for some time that the 8 GeV beam lifetime in the main ring is very sensitive to the presence of non-linear fields. In order to have a working estimate of the fields that can be tolerated (at C-0, for example), we present in this memo the example of a resonance driven by a regular sextupole field at a point where β_y is large. In Figure 1a, we show the 0.3 sec. transmission of the 8 GeV beam (as determined by gas scattering out of the aperture determined by the resonances) for the uncorrected machine. The large dip at the arrow is caused by the $2\nu_y + \nu_x = 61$ sextupole resonance. In Figure 1b, the transmission is shown after this resonance has been removed by exciting appropriate correction sextupoles. The $\Sigma|\int Bdl|$ of all the sextupoles used in the correction is 180 Gauss-cm/$_{cm^2}$.

R. F. Stiening

RFS:csn

MAIN RING 0.3 SEC. TRANSMISSION AT 8 GeV

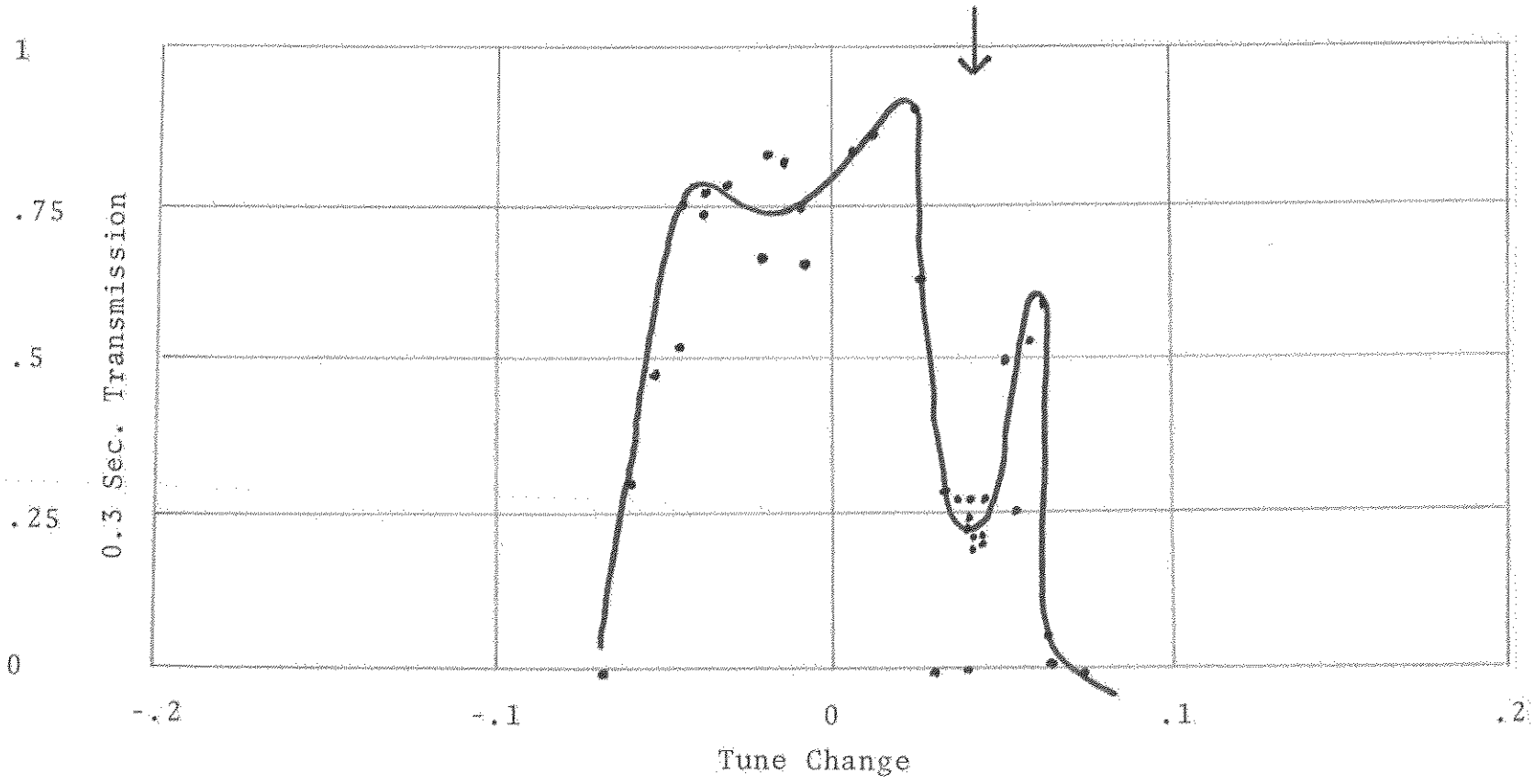

Figure 1a.

MAIN RING 0.3 SEC. TRANSMISSION AT 8 GeV

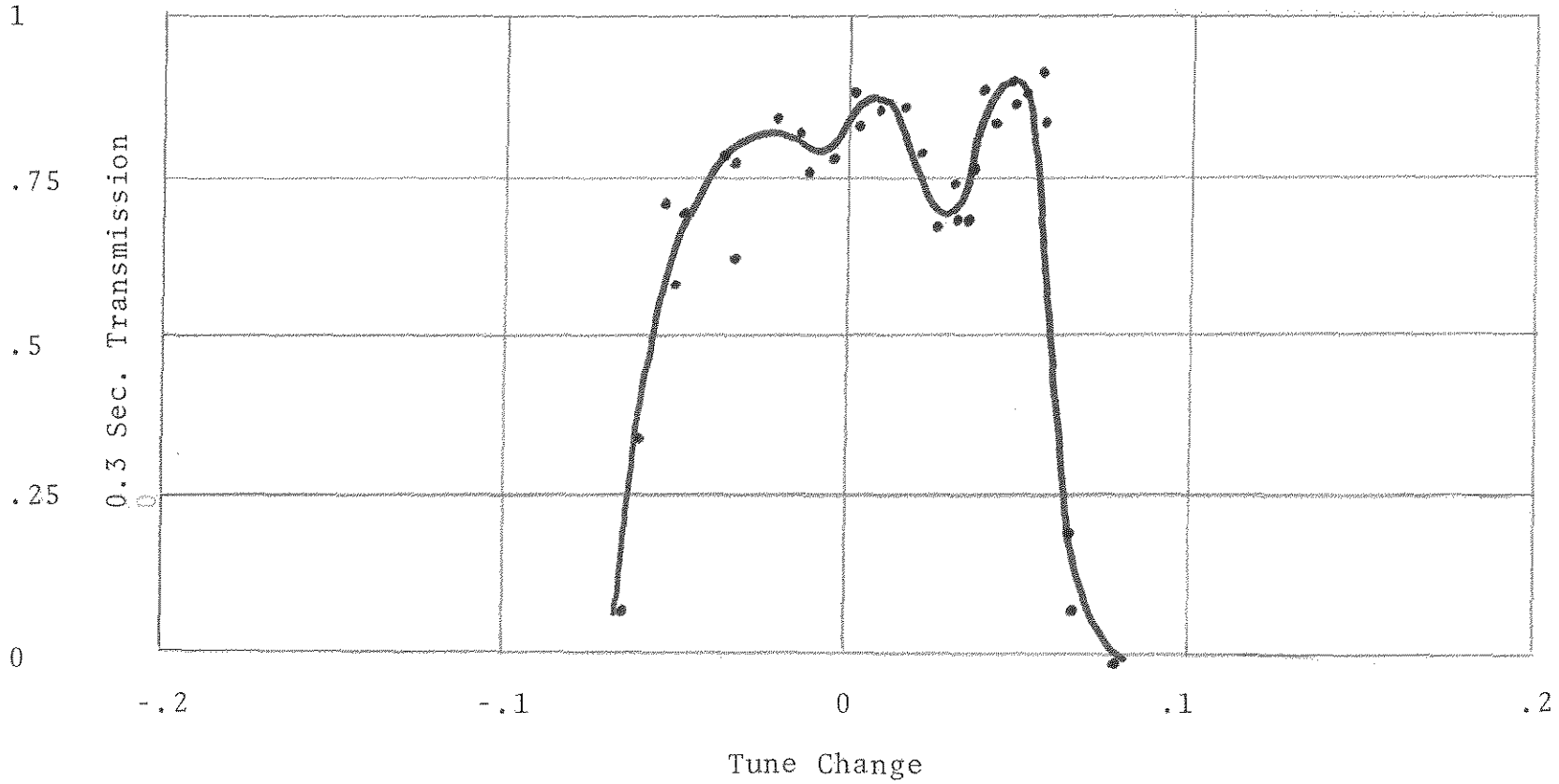

Figure 1b.