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Memorandum

To : ISRC

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Subject : Symbiosis of  $\sigma_T(\bar{p}p)$  experiments in I<sub>2</sub>.

Some time ago a Letter of Intent and a proposal were submitted requesting the re-installation of the Roman Pots and the hodoscopes with which  $\sigma_T$  and  $\rho = \text{Re}/\text{Im}$  had been measured in pp by Amaldi et al. The purpose of this request is threefold: 1) to measure  $\sigma_T(\bar{p}p)$ ; 2) to measure  $\rho(\bar{p}p)$ ; and 3) to obtain an accurate measurement of the differences  $\sigma_T(pp) - \sigma_T(\bar{p}p)$  and  $\rho(pp) - \rho(\bar{p}p)$  by a remeasurement, with the same equipment, of  $\sigma_T(pp)$  and  $\rho(pp)$ .

Since then we have considered the question to what extent these objectives are compatible with an eventual installation of the Roman Pots and the hodoscopes for  $\sigma_T$  in I<sub>2</sub>, rather than in I<sub>6</sub> where the group is currently running experiment R607. This would have the advantage that the measurements could be combined with those of the  $4\pi$  detector which has been proposed for I<sub>2</sub>, in the event that both proposals would be approved by the ISRC.

We have furthermore considered to what extent the equipment for  $\sigma_T$  and the equipment for  $\rho$  could be installed at the same time. It is clear that scheduling problems, associated with the long cooling times required for antiprotons and the need for re-injection into the PS prior to transfer to the ISR, are likely to cause major delays. It is our intention therefore to measure  $\sigma_T$  and  $\rho$  at each energy as much as possible with the same p stack.

Our tentative conclusion is that a symbiosis of a  $4\pi$  detector,  $\sigma_T$  hodoscopes at small angles and  $\rho$ -hodoscopes in the Roman pots in I<sub>2</sub> is technically possible although less than optimum for either set-up by itself.

In solving the remaining problems a great deal can be achieved by clearly defining and dividing the responsibilities of the two groups. We propose that for simplicity and in order to facilitate the construction of counters and supports the region  $\gtrsim 15$  mrad be entirely instrumented by the  $4\pi$  detector group, while the region of  $\lesssim 15$  mrad be entirely instrumented by the small angle group. We suggest furthermore that there be full exchange of information at the hardware level during the data taking. We would welcome appropriate guidelines from the ISRC, in the event that both proposals are approved for running in the same intersection.