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M E M O R A N D U M

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PSCC/85-71/P91

to PSCC Committee

With this memorandum we would like

- 1) To thank one of the referees (D. Bugg) for the careful reading of our proposal (PS 90) and for the very complete report written on it.
- 2) To comment on this report and recorrect some mistakes.
- 3) To ask some support from the CERN electronic pool.

I. - COMMENTS ON THE REFEREE REPORTa) Physics

Spin observables are very sensitive to :

- i) the tensor component (π, ρ, ω) of the meson exchange potential (real)
- ii) the spin dependence of the absorption potential $W(r)$.

There is less sensitivity to $\sigma_1 \cdot \sigma_2$, L.S., Q_{12} components of the potential.

The angular region where one sees the maximum model dependence for spin observables corresponds to the backward (C.M.) angles. These statements are supported by three kinds of simulations with the Dover-Richard (DRI and DRII) and PARIS models.

Comparison between theory and experiment has to be performed directly on the spin observables. The pretention to extract some amplitudes from the data in order to recompute theoretical values of the spin observables is, to our feeling, a wrong approach. Spin observables are transcendent functions of the amplitudes. Chi square fits are possible only if an enormous amount of data are available. Otherwise the uncertainty on the fits gives a very loose relationship with the theoretical inputs. In this way

one just washes out the information. Anyway the direct comparison of theoretical simulations and experimental data is suggested, since many years, even for nucleon-nucleon scattering data (see, for example, R. Vinh Mau, Versailles Conf.). Therefore we disagree with the approach proposed by the referee.

b) Experiment

i) The relationship between target thickness and energy resolution has been discussed in the proposal and in the oral presentation. The quoted value (less than 2 MeV) is the overall energy resolution in the missing mass spectrum. This prediction is supported by our experience of high energy resolution spectrometers (since 1971) and on the results of PS 184.

The 3mm target will be an homogeneous block (no beans) of frozen propanediol (or butanol). In addition, two monitor systems will be available : one for the anti-proton flux and a second one detecting at 0° and out of the scattering plane, reaction products from the target. The beam will hit the same target volume in the spin up and down runs.

ii) The angular acceptance of SPES II is 30 msr and not 2 msr as quoted by the referee. In the oral presentation, assuming a beam intensity of $5 \cdot 10^6$ \bar{p}/s , $d\sigma/d\Omega = .4$ mb/sr and a polarimeter efficiency = .07, we have estimated a running time of 1/2 hour to get 500 counts for one spin state, that is about one hour for this cross section and asymmetry.

Therefore we claim that the measurement of the Wolfenstein parameters is feasible with the post ACOL beam intensities.

II. - We ask from CERN to get an allocation from the electronic pool similar to that given for the PS 184 experiment that is 250 KF.

We join also some comments and theoretical predictions kindly provided by C. Dover.