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INTERSECTING STORAGE RINGS COMMITTEE

LETTER OF INTENT

INVESTIGATION OF POSSIBLE PARITY VIOLATING EFFECTS
IN PROTON PROTON COLLISIONS AT ISR

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It is proposed to test, within about 10^{-2} , the presence of parity violating amplitudes in proton proton collisions at ISR energies.

The method is the following:

One observes a particle M, of spin $1/2$, produced by p-p collisions. Any component of its polarisation in its plane of production P indicates the presence of a parity violating interaction.

Let us consider the center of mass reference system. In the plane P there are two components of polarisation of M, longitudinal and transverse, which can have quite different implications.

A longitudinal polarisation of M could be due to parity violation in p-p interaction or to the weak decay of a particle M' (let us say a Ξ^0) giving a particle M (let us say a Λ^0).

But it can be shown that if the observed particle M comes from the weak decay of a particle M' produced in a parity conserving interaction, and if the decay parameter β of M' (assumed spin $1/2$) is zero, then M cannot have a transverse polarisation in its production plane.

It thus appears that, if seen, the most conservatory explanation of that transverse polarisation should be a parity violating term in p-p interaction.

We propose to detect Λ 's with a large acceptance set-up and to analyse their ($\pi^- p$) decays.

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Possible convenient set-ups are, for example, the R602, R603 or forward director in SFM. One should like to have the smallest possible beam tube around the interacting region in order to have a selective trigger on Λ 's.

It seems reasonable to try to detect them at the largest angle compatible with counting rates which permit the accumulation of a few 10^4 Λ 's.