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REQUEST FOR MACHINE TIME ON π° LIFETIME EXPERIMENT

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The last run of January on the π° lifetime has given the following result:

$$\pi^{\circ} = 1.5 \; {}^{+ \; .7}_{- \; .8} \; 10^{-16} \text{ sec.}$$

The figure is very preliminary and subject to slight corrections. It is in rough agreement with the last emulsion work[1] $(1.9 \pm .5 \text{ sec})$ and the photoproduction experiment[2] $(1.7 \pm 1.4 \text{ sec})$. This run convinced us that the method works and can give a much better accuracy.

Our large error is due to three facts.

1) The lifetime is smaller than expected, so for the same statistics the relative error is larger;

2) In order to prevent the internal beam from hitting the frame of the targets we had to use "kicker magnets" which reduce the target efficiency and so our counting rate;

3) Our production running-time was actually 2 shifts only. This is because the target setting was much more critical than expected and took us a lot of time.

The sensitivity to the shorter lifetime (1) can be increased by using a thinner target. Although we cannot obtain much improvement on point 2, we think that with more machine time we should be able to reduce the error of the measurement at least in the ratio of the square roots of the effective running times.

In conclusion we would like to ask for 12 shifts full machine time + 4 shifts of parasitic time for setting up.

REFERENCES

1) Glasser, Seeman, Stiller - Phys.Rev. 123, 114 (1961).
2) Tollestrupp, Ruderman - Bull.Am.Phys.Soc. 5, 508 (1960).