



CM-P00071462

ISR PERFORMANCE REPORTRun 354, Ring 2, 7th Sept. 1973Ionisation measurement of SodiumPurpose

Since the ionisation cross-section of sodium for protons at PS energies is unknown, we thought that it can be measured with the existing set-up of the B.P. monitor.

Experiment

An extraction voltage of 200 (V.) was applied to the electrodes of the B.P. monitor across two picco amperemeters. The two intermediate electrodes served as guard electrodes (see fig. 1). The magnetic guide field B of 300 Gauss assured to 95% of all Na ions a spiral radius of less than 1.4 cm.

The sodium curtain in the middle of the chamber had a density equivalent to $6 \cdot 10^{-7}$ Torr. A proton beam of 1.6 A circulating at the position + 3, + 10, yielded $5.1 \cdot 10^{-10}$ Ampers of Na ions. These numbers give a primary ionisation of $0.5 \text{ (Torr m)}^{-1}$ for sodium, which is in rough agreement to the one obtained, when the image of the proton beam produced by the residual gas pressure is compared to the one produced by the sodium curtain.

Because of parasitic currents induced by the repetitive injections in Ring 1 and because of lack of time we could not measure systematically the influence of the space charge and of the secondary electrons.

Conclusion

A value of $0.5 \text{ (Torr m)}^{-1}$ for the primary ionisation of sodium by protons of 26 GeV/c has been found. However further measurements will be necessary in order to confirm this value and to study the influence of the space charge and of secondary electrons.

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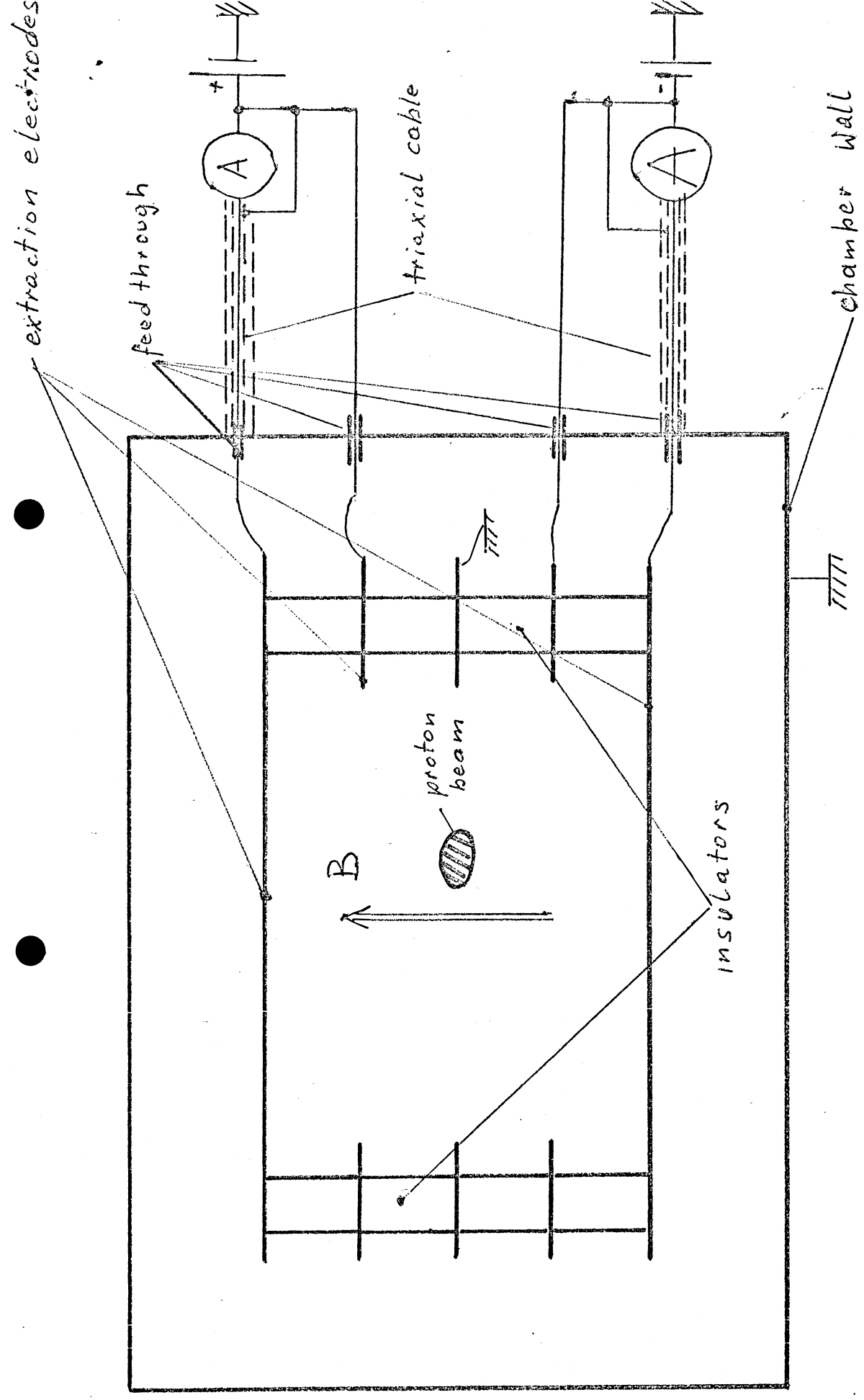


fig. 1 (1:2)
 scale: