— Abstracts of Papers —

The following 34 abstracts are the second part out of 79 papers, read at the semi-annual meeting of the Institute on 10th and 11th June, 1950.

41. On the Delayed Coincidence Circuits. (I)

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The principle of our circuits is as follows: when a rectangular pulse A (time width t_A) and the other rectangular pulse B which is delayed Δt for the one pulse A come into the coicidence circuits one after another, the output pulse of the C. C. should have larger height only in the part of the time where the two pulses are superposed. Therefore the width of the larger height part should be $t_A - \Delta t$. In the next stage, the saw-toothed pulse is to be generated from the output of this stage is devised so that the height of the saw-toothed pulse may be proportional to the width of the coincidence pulse. Then, as the last step, these saw-toothed pulses of different sizes are sent into the mechanical recorder circuits and each of these recorders is so adjusted that it should operate only when the height of the pulses remains within the definite limit. Thus we can see the distribution of the delayed time by the counts of each recorders. The distinctive feature of our circuits is this: it has high efficiency in measuring the delayed time as the counts from many sub-intervals (for instance 0–0.2μsec, 0.2–0.4, 0.4–0.6, 0.6–0.8, 0.8–1.0) can be recorded after one observation, thus saving time.

The rise time of the M. V. pulse is a main factor to determine accuracy in our measurement; and, at the same time, a great difficulty lies in the fact that the fast rise time pulse is very hard to be generated. According to our calculation, it is desirable to lessen the time constant of the M. V. circuits as much as possible and to use high Gm tubes for this purpose. The result of the calculation was applied to the construction of the circuits and we could succeed in generating the M. V. pulses having very fast rise time (0.075μsec.) and small width (0.6μsec.). Shapes of the pulses from the M. V. and the coincidence pulses of various delayed time were photographed by the synchroscope method.