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Standards of Capacity

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STANDARDS OF CAPACITY

J. B. DEMPSTER, E. G. LINDER, AND E. O. HULBURT

(*ABSTRACT*)

In order to calibrate with precision condensers for use in radio frequency measurements, three standard condensers of coaxial cylindrical plates were made after the manner described by the former Lord Rayleigh. The three condensers were of capacities 25, 50, and 100 micro-micro-farads. By means of continuous wave radio frequency currents from an electron tube generator a variable air condenser with a vernier was calibrated by a step by step method. This was used as a secondary standard. The measurements were accurate to less than one-half micro-micro-farad, and the calibration was correct to considerably less than one per cent, for capacities greater than twenty micro-micro-farads. Measurements showed that isolated metal spheres and metal discs could not be readily used as standards, that is, their calculated and measured capacities were not in agreement because of unavoidable capacity effects. On the other hand, the capacities of small parallel plate variable condensers were found to be in close agreement with the values calculated from the dimensions of the plates and the distance apart of the plates. The plates were of brass 2.5 mm in thickness, the back surfaces being beveled until the edges were thin. The plates were circular, those of one condenser being 7 cms in diameter, of another 10 cms. The distance apart of the plates was varied by a slow screw adjustment.

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