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**ON THE CIRCLE CRITERION
FOR BOUNDARY CONTROL SYSTEMS IN FACTOR FORM**

Abstract. In this paper we return to the origins of the circle criterion initiated by Irwin Sandberg nearly forty years ago. A version of the Leray-Schauder alternative is applied to get an existence of an abstract Hammerstein output equation for the closed-loop system. This existence result completes Sandberg's method based on using the Banach fixed-point theorem. It is shown that the assertion of the circle criterion can be strengthened by adding a characterization of an asymptotic behaviour of the state trajectories. Results are being compared with a recent version of the circle criterion for boundary control systems in factor form. Some prospects for further studies are also suggested.

Keywords: infinite-dimensional control systems, semigroups, Lyapunov functionals, circle criterion.

Mathematics Subject Classification: Primary 93B, 47D, Secondary 35A, 34G.