

Toposym Kanpur

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On Feller boundary

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ON FELLER BOUNDARY

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Given a measurable space (X, \mathbf{B}) and a substochastic transition function $p(x, A)$ it is shown that the bounded harmonic functions form an abstract M -space and hence by invoking a theorem of Kakutani, the Feller boundary Γ is introduced. Then specializing to the case when X is countable, it is observed that Γ is totally disconnected. Following Feller, a natural topology on $X \cup \Gamma$ is introduced justifying the terminology that Γ is a boundary of X . By a simple observation, the harmonic measures are calculated. It is also shown that one can represent the collection of bounded harmonic functions as the collection of essentially bounded functions of a certain measure space. Finally it is shown that there do exist points on Γ corresponding, in a natural way, to bounded minimal harmonic functions.

Note added on July 7, 1969. For similar – and more general – treatment, we refer the reader to the paper “Feller boundary induced by a transition operator” by S. P. Lloyd in the *Pacific Journal of Mathematics* 27 (1968) No. 3, 547–566. The author has belatedly seen this paper.

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