

On the hitting times of continuous-state branching processes with immigration

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Abstract: We study a two-dimensional joint distribution related to the first passage time below a level for a continuous-state branching process with immigration. We provide an explicit expression of its Laplace transform and obtain a necessary and sufficient criterion for transience or recurrence. We follow the approach of Shiga, T. (1990) for Ornstein-Uhlenbeck type processes by finding some λ -invariant functions for the generator.