1157-60-155 **PANKI KIM** (pkim@snu.ac.kr) and **Renming Song*** (rsong@illinois.edu), Department of Mathematics, University of Illinois, 1409 W Green St, Urbana, IL 61801, and **Zoran Vondracek** (pkim@snu.ac.kr). *On potential theory of Markov processes with jump kernels decaying at the boundary.*

We study processes in an open set $D \subset \mathbb{R}^d$ defined via Dirichlet forms with jump kernels of the form $J^D(x,y) = j(|x-y|)B(x,y)$ and critical killing functions. Here $j(|x-y|)$ is the Lévy density of an α-stable process in $\mathbb{R}^d$. The main novelty is that the term $B(x,y)$, depending on three parameters $\beta_1, \beta_2, \beta_3$, tends to 0 when x or y approach the boundary of D. Under some general assumptions on $B(x,y)$, we prove that the Harnack inequality and Carleson's estimate.

In the second part, we specialize to the case of the half-space $D = \mathbb{R}^d_+$ and the killing function $\kappa(x) = cx_d^{-\alpha}$. Our main result is a boundary Harnack principle which says that, for any $p > (\alpha-1)_+$, there are values of $\beta_1, \beta_2, \beta_3$ and the constant c such that non-negative harmonic functions of the process must decay at the rate x_d^p if they vanish near a portion of the boundary for any $p > (\alpha-1)_+$, there are values of the parameters $\beta_1, \beta_2, \beta_3$ and the constant c such that We further show that there are values of $\beta_1, \beta_2, \beta_3$ for which the boundary Harnack principle fails despite the fact that Carleson's estimate is valid. (Received January 26, 2020)