

**HARNACK'S INEQUALITIES FOR DIRICHLET FORMS AND THEIR  
APPLICATIONS TO DIFFUSION PROCESSES**

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*Abstract:* Consider the Dirichlet space associated with a direct product diffusion process. Dirichlet forms having the same domain as it can be expressed by integro-differential forms [7]. We establish two estimates for harmonic functions with respect to such Dirichlet forms, which correspond to Harnack's inequalities in the theory of partial differential equations. Further we show the continuity of such harmonic functions. Then we apply those results to study some properties of diffusion processes associated with Dirichlet forms as above.

**2000 AMS Mathematics Subject Classification:** Primary: -; Secondary: -;

**Key words and phrases:** -

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