DIRICHLET FORMS AS BANACH ALGEBRAS AND APPLICATIONS.

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ABSTRACT. The aim of this work is to study regular Dirichlet forms on locally compact Hausdorff spaces X in the framework of the theory of commutative Banach algebras. We prove that, suitably normed, the *Dirichlet algebra* $\mathcal{B}_e = C_0(X) \cap \mathcal{F}_e$ of continuous functions vanishing at infinity in the extended form domain $\mathcal{F}_e$ is a semisimple Banach algebra. After describing its ideal structure we then apply the analysis to the following problems: i) the relative representation of Dirichlet forms with common domain $\mathcal{F}$; ii) the isomorphism between the algebraic K–Theory $K_*(\mathcal{B}_e)$ of the Dirichlet algebra $\mathcal{B}_e$ and the topological K–Theory $K^*(X)$ of X; iii) the construction of Dirichlet structures on (sections of) finite dimensional, locally trivial vector bundles over X.

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Key words and phrases. Dirichlet form, Dirichlet algebra, Banach algebra, K–Theory.

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