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*Subspaces of spherical functions of the crossed product.*

Let  $\delta$  be an action of a compact quantum group  $G$  on a  $C^*$ -algebra  $B$ . We give necessary and sufficient conditions for the simplicity of the crossed product  $B \times_{\delta} G$  in terms of certain subspaces of spherical functions. (Received August 29, 2006)