On the isotropy group of a simple derivation

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Let R $= K[X_1; \ldots; X_n]$ be a polynomial ring in n variables over a field K of charactersitic zero and d a K-derivation of R. Consider the isotropy group of d. In his doctoral thesis, Baltazar proved that if d is a simple Shamsuddin derivation of $K[X_1; X_2]$, then its isotropy group is trivial. He also gave an example of a non-simple derivation whose isotropy group is infinite. Recently, Mendes and Pan generalized this result to an arbitrary derivation of $K[X_1; X_2]$, proving that a derivation of $K[X_1; X_2]$ is simple if, and only if, its isotropy group is trivial. In this talk, we prove that the isotropy group of a simple Shamsuddin derivation of the polynomial ring $R = K[X_1; \ldots; X_n]$ is trivial.

We also calculate other isotropy groups of (not necessarily simple) derivations of $K[X_1; X_2]$ and prove that they are finite cyclic groups. These results are a joint work with Luciene Bertocello.