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Isomorphisms of Cylinders over Danielewski Surfaces

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In 1989, Danielewski gave the first examples of non-isomorphic affine complex algebraic surfaces such that their cylinders, that is, their products with an affine line, are isomorphic. These examples have been generalized to large families of surfaces satisfying the condition that the cylinders are all isomorphic. These surfaces are realized as total spaces of principal homogeneous bundles over an affine line with multiple origins. The original proof of isomorphic cylinders was non-constructive. In this talk, I will describe how, using a technique of studying locally nilpotent derivations, we can find explict isomorphisms of these cylinders. I will then discuss some consequences and generalisations of the methods used. This is joint work with P. M. Poloni.

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