Automorphism groups of fields of generalised series.

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Abstract: Inspired by Schilling's work [O. F. G. Schilling. *Automorphisms of fields of formal power series.* Bull. Amer. Math. Soc. 50.12 (1944), pp. 892-901], we extend the investigation to study the automorphism group of the field of generalised power series $\mathbb{K} := k((t^G))$ with coefficients in the ground field k and exponents in the ordered abelian group G. More precisely, we study the valuation preserving automorphisms of $\mathbb{K}/k$ and present $Gal(\mathbb{K}/k)$ as a semi direct product of the group of internal automorphisms and external automorphisms. We refine the description by further analysing each of these direct factors. The normal subgroup of internal automorphisms is closely related to the group of units of the valuation ring of generalised formal power series. The external automorphisms are determined by the order preserving automorphisms of the exponent group G. This in turn requires understanding the automorphism group of the so-called Hahn groups. Moreover, we will dedicate special attention to interesting subgroups, such as the group of strongly linear (commuting with infinite sums) automorphisms.

The talk will be mostly self-contained and accessible to early stage researchers, many examples will be given to illustrate the concepts and the results.