

# Prime factorization of hierarchical products of infinite graphs

Wilfried Imrich<sup>(1)</sup>

<sup>(1)</sup> Department Mathematics and Information Technology, Montanuniversität Leoben, A-8700 Leoben, Austria

The hierarchical product, also known as the comb product, has been used in the context of quantum probability and spectral analysis of graphs in 2007 by Accardinet al., and by Hora and Obata. It is a special case of a product, whose spectral properties were studied in 1978 by Godsil and McKay, and was reintroduced by Barrière et al. in 2009.

The talk presents an outline of known results, and continues with the prime factorization of infinite graphs. Together with Kalinowski and Pilśniak it was recently shown that all connected finite graphs have unique prime factorization with respect to the hierarchical product. Here the result is extended to connected infinite rayless graphs, and conditions are provided under which this also holds for locally finite infinite graphs. Furthermore, factorization properties of special classes of graphs are investigated, as well as the structure of the automorphism group of hierarchical products.