Self-adjoint operators associated with Hankel moment matrices

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In a paper from 2016 D. R. Yafaev initiated a study of closable Hankel forms associated with the moments (m_n) of a positive measure with infinite support on the real line. If $m_n = o(1)$ Yafaev characterized the closure of the form based on earlier work on quasi-Carleman operators. We give a new proof of the description of the closure based entirely on moment considerations. The main purpose is a description of the self-adjoint Hankel operators associated with closed Hankel forms in the Hilbert space of square summable sequences. We do this not only in the case $m_n = o(1)$ studied by Yafaev but also in two other cases, where the Hankel form is closable, namely if the moment sequence is indeterminate or if the moment sequence is determinate with finite index of determinacy.

The talk is based on a joint paper with Christian Berg (to appear in JFA).