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Wirthmüller's theorem and modular differential equations for basic Jacobi forms

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The graded rings of Weyl-invariant weak Jacobi forms play an important role in the theory of Frobenius varieties.
Basis generators of these rings are also generating functions of some quantities (indices of vector bundles, Gromov-Witten invariants, multiplicities of positive roots of Lorentzian Kac-Moody algebras). The case of the root system D_n is very interesting from this point of view.
With my formal Ph.D. student Dimitri Adler, we generalise the idea of the D_8-tower of Jacobi forms coming for the theory of reflective modular form, and give a simple constructive proof of the Wirthmüller theorem for the root system D_n. Then we study the modular differential equations for the most important generators. A surprise is that there are unusual anomalies for some n and reasonable differences for varieties such as $K3$ surfaces and CY_3.

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