Saito-Kurokawa Lift for Orthogonal Modular Forms

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The aim of this paper is to give a short proof of the Saito-Kurokawa lift for orthogonal modular forms along the lines we gave in two earlier papers [3], [4]. The proof uses a converse theorem as was stated by Imai [2] for Siegel modular forms as was already done by Duke and Imamoglu [1], yet avoiding the framework of spectral analysis.

Instead we are able to write the partial Mellin transform of the Saito-Kurokawa lift as a Rankin-Selberg integral of the theta lift of f twisted by an Eisenstein series. The functional equation of the Eisenstein series then implies the desired functional equation for the partial Mellin transform which in turn proves the lift to be an orthogonal modular form.

References

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