# On the integral kernel for a multiple Dirichlet series associated to Siegel cusp forms

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Let $F$ be any weight $k$ Siegel cusp form over the symplectic group $Sp_2(\mathbb{Z})$. The Koecher-Maass series $D(F, w)$ is a single variable Dirichlet series constructed with the Fourier coefficients of $F$. If $U$ is a Maass waveform, one can define the twisted Koecher-Maass series $D(F, U, w)$. In particular, if let $U$ run over all waveforms with eigenvalue in the continuum spectrum then the collection of such twisted Koecher-Maass series is a two variables Dirichlet series $D(F, s, w)$. In this talk I introduce a kernel $\Omega_{k,s,w}$ which gives an integral representation of $D(F, s, w)$ for all $F$. Then I show; i) how to get the main analytic properties of $D(F, s, w)$ from those of $\Omega_{k,s,w}$, ii) how to write $D(F, s, w)$ as an infinite sum of Dirichlet series associated to the Jacobi forms in the Fourier-Jacobi expansion of $F$, and iii) an explicit formula for $D(F, s, w)$ in terms of a Rankin-Selberg convolution of $h$ in case that $F$ is the Saito-Kurokawa lift of $h$.