~~A~~ A certain Dirichlet series associated to ~~S~~ Siegel modular forms of degree 2.

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Before I start to explain in more detail results I should perhaps make some general remarks concerning the topic of this talk. I shall speak about the connection between Siegel modular forms of degree two and Jacobi forms. More precisely, every Siegel modular form of degree two has a so-called Fourier-Jacobi expansion, i.e. a Fourier expansion so that the Fourier coefficients are again automorphic forms: namely Jacobi forms. Now, the theory of Jacobi forms is meanwhile very well developped. One understands Jacobi forms much better than Siegel modular forms of degree two. So it seems to be a good idea to start or to reconsider investigations in the direction of the following program:

Study Siegel modular forms of degree two via their Fourier-Jacobi-expansion.

The results that I would like to explain here can be viewed as part of such a program. Finally I should mention that these results come from joint work with <u>W. Kohnen</u>.

~~Before I can state and explain the results I w~~

So let me begin by introducing or reminding you of some basic notions.

<u>Fourier-Jacobi-development of a Siegel ~~mod.~~ form of degree 2</u>:

Let $F \in M_k(\Gamma_2)$ $(\Gamma_2 = Sp_2(\mathbb{Z}))$, thus $F = F(\tau, z, \tau')$ where $\tau, \tau' \in \mathfrak{H}$, $z \in \mathbb{C}$ such that $\operatorname{Im}\begin{pmatrix} \tau & z \\ z & \tau' \end{pmatrix} > 0$. Then F is ~~especially~~ periodic in each variable, especially it is periodic in the third variable; thus it has a Fourier development with respect to the third variable:

$$F = \sum_{m \geq 0} \varphi_m(\tau, z)\, e^{2\pi i m \tau'}$$

If $F = \sum_{\substack{n,m \geq 0 \\ r^2 - 4nm \leq 0}} c(n,r,m)\, e^{2\pi i(n\tau + rz + m\tau')}$ then $\varphi_m(\tau, z) = \sum_{r^2 - 4nm \leq 0} c(n,r)\, e^{2\pi i(n\tau + rz)}$

Now F ~~which~~ has by definition a certain automorphic behaviour with respect to Γ_2 and it is clear that ~~this implies a an automorphic behav~~ therefore the $\varphi_m(\tau, z)$ must also show some automorphic behaviour with respect to ~~which~~ some subgroup of Γ_2.