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*Real analytic Eisenstein series twisted by integral non-discrete unitary characters*

Let  $K$  be a totally real field of degree  $g$  over  $\mathbb{Q}$ . Let  $\mathfrak{h}$  be the Poincaré upper half plane. In this talk we will introduce a family of Eisenstein series  $E(z, \tilde{\omega}, s)$  where  $z \in \mathfrak{h}^g$ ,  $s \in \mathbb{C}$  and  $\tilde{\omega} : (K \otimes_{\mathbb{Q}} \mathbb{C})^{\times} \rightarrow S^1$  is an integral unitary character. It is a real analytic function in  $z$  and a meromorphic function in  $s$ . We will then proceed by presenting its main properties: (a) Its Fourier series expansion and its relationship with  $GL_1$  automorphic forms, (b) its automorphic properties, (c) the fact that it is an eigenvecor for the hyperbolic Laplacian, (d) some growth estimates etc. Then we will give an analytic characterization of  $E(z, \tilde{\omega}, s)$ . Finally, if time permits, we may discuss a Kronecker limit formula that we have computed for the function  $s \mapsto E(z, \tilde{\omega}, s)$  in a neighbourhood of  $s = 1$ .