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Differentiability of Fourier Series of the form

$$F_k(\tau) = \sum_{n=1}^{\infty} \frac{\sigma_{k-1}(n)}{n^{k+1}} e^{2\pi i n \tau} \text{ for } k \text{ even.}$$

In my talk, I will discuss the differentiability of Fourier Series of the form $F_k(\tau) = \sum_{n=1}^{\infty} \frac{\sigma_{k-1}(n)}{n^{k+1}} e^{2\pi i n \tau}$ for k even. These series are related to Eisenstein Series. Using modular (and quasi-modular) properties of Eisenstein Series, we can find functional equations for F_k , from which we can draw some conclusions on differentiability of F_k . This approach was introduced by Itatsu in 1981 in a paper on Differentiability of Riemann's Function. We find that the differentiability of F_k at an irrational point x depends on the properties of continued fraction expansion of x .