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**Zhilin Luo\*** (luoxx537@umn.edu), **Qinghua Pi** and **Han Wu**. *On the Summation of Root Numbers of Holomorphic Cusp Forms of  $\mathrm{PGL}_2$ .*

Over a totally real field  $F$  with  $F \otimes_{\mathbb{Q}} \mathbb{R} \simeq \mathbb{R}^n$ , an explicit formula for

$$\sum_{\pi \in \mathcal{A}_{\mathrm{cusp}}(\mathfrak{N}^3, \vec{k})} \varepsilon\left(\frac{1}{2}, \pi, \psi\right)$$

is established. Here  $\pi \in \mathcal{A}_{\mathrm{cusp}}(\mathfrak{N}^3, \vec{k})$  is the set of cuspidal automorphic representations of  $\mathrm{PGL}_2$  whose Archimedean component is a discrete series of weight  $2\vec{k}$ , where  $\vec{k} \in \mathbb{N}^n$ , and  $\mathfrak{N}$  is a finite product of local non-Archimedean places of  $F$ . In particular, for any  $\mathfrak{p} \mid \mathfrak{N}$  and  $\pi \in \mathcal{A}_{\mathrm{cusp}}(\mathfrak{N}^3, \vec{k})$ ,  $\pi_{\mathfrak{p}}$  is always a simple supercuspidal representation. This is a joint work with Q. Pi and H. Wu. (Received January 19, 2021)