
On a modification of the group of circular units of a real abelian field

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For a real abelian field K , Sinnott's group of circular units C_K is a subgroup of finite index in the full group of units E_K playing an important role in Iwasawa theory. Let K_∞/K be the cyclotomic \mathbb{Z}_p -extension of K , and h_{K_n} be the class number of K_n , the n -th layer in K_∞/K . Then for $p \neq 2$ and n going to infinity, the p -parts of the quotients $[E_{K_n} : C_{K_n}]/h_{K_n}$ stabilize. Unfortunately this is not the case for $p = 2$, when the group $C_{1,K}$ of all units of K , whose squares belong to C_K , is usually used instead of C_K . But $C_{1,K}$ is better only for index formula purposes, not having the other nice properties of C_K . Our aim is to offer another alternative to C_K which can be used in cyclotomic \mathbb{Z}_p -extensions even for $p = 2$ still keeping almost all nice properties of C_K .