

1135-11-2077

Nina V Zubrilina* (nina57@stanford.edu), 531 Lasuen Mall, P.O. Box 17601, Stanford, CA 94309. *Bounds on the Number of Connected Components of the Sigma Divisor Function.*

For $r \in \mathbb{R}, r > 1$ and $n \in \mathbb{N}$, the generalized sigma divisor function σ_{-r} is defined by $\sigma_{-r}(n) = \sum_{d|n} d^{-r}$. We show the number C_r of connected components of $\overline{\sigma_{-r}(\mathbb{N})}$ satisfies

$$\pi(r) + 1 \leq C_r \leq \frac{1}{2} \exp \left[\frac{1}{2} \frac{r^{20/9}}{(\log r)^{29/9}} \left(1 + \frac{\log \log r}{\log r - \log \log r} + \frac{\mathcal{O}(1)}{\log r} \right) \right],$$

where $\pi(t)$ is the prime counting function. We also show that C_r does not take all integer values, namely that it cannot be equal to 4. (Received September 26, 2017)