1147-30-726 **Michel L. Lapidus**, **Goran Radunovic*** (goran.radunovic@math.hr) and **Darko Zubrinic**.
Complex dimensions generated by essential singularities. Preliminary report.

Complex dimension are usually defined as poles of the associated fractal zeta function and provide a far-reaching generalization of the classical notion of the Minkowski dimension. We explore complex dimensions which arise as essential singularities of geometric zeta functions associated with bounded fractal strings as well as essential singularities of distance zeta functions associated with compact subsets of $\mathbb{R}^N$. For any three prescribed real numbers D_∞, D_1 and D in $[0,1]$, such that $D_\infty < D_1 \leq D$, we construct a bounded fractal string $\mathcal{L}$ such that $D_{\mathrm{par}}(\zeta_{\mathcal{L}}) = D_\infty$, $D_{\mathrm{mer}}(\zeta_{\mathcal{L}}) = D_1$ and $D(\zeta_{\mathcal{L}}) = D$. Here, $D(\zeta_{\mathcal{L}})$ is the abscissa of absolute convergence of $\zeta_{\mathcal{L}}$, $D_{\mathrm{mer}}(\zeta_{\mathcal{L}})$ is the abscissa of meromorphic continuation of $\zeta_{\mathcal{L}}$, while $D_{\mathrm{par}}(\zeta_{\mathcal{L}})$ is the infimum of all positive real numbers a such that $\zeta_{\mathcal{L}}$ is holomorphic in the right open half-plane $\{\mathrm{Re}\ s > a\}$, except for possible isolated singularities in this half-plane. We extend this construction to the case of distance zeta functions ζ_A of compact sets A in $\mathbb{R}^N$, for any $N \geq 1$. (Received January 29, 2019)