

Quasihyperbolic geometry and domains associated with a homeomorphism

SWADESH KUMAR SAHOO

Associate Professor

Discipline of Mathematics
Indian Institute of Technology Indore
swadesh.sahoo@iiti.ac.in
URL: www.iiti.ac.in/~swadesh

The talk is mostly geometric in nature. First we consider the quasihyperbolic metric, which is a generalization of the classical hyperbolic metric of the upper half-space. Main focus is to present geometric properties of a special class of domains the so-called φ -uniform domains, where $\varphi : [0, \infty) \rightarrow [0, \infty)$ is a strictly increasing homeomorphism satisfying $\varphi(0) = 0$ and $\varphi(t) \rightarrow \infty$ as $t \rightarrow \infty$. The φ -uniform domains are natural generalizations of uniform domains introduced by F.W. Gehring and B. Osgood, where the quasihyperbolic metric plays a crucial role. Finally, certain mapping properties of φ -uniform domains are discussed and some examples (and counterexamples) are illustrated.

References

- [1] F.W. Gehring and B. Osgood, *Uniform domains and the quasihyperbolic metric*, J. Anal. Math. **36** (1979), 50–74.
- [2] P. Hästö, R. Klén, S. K. Sahoo, and M. Vuorinen, *Geometric properties of φ -uniform domains*, J. Anal., **24** (2016), 57–66.
- [3] R. Klén, Y. Li, S.K. Sahoo, and M. Vuorinen, *On the stability of φ -uniform domains*, Monatshefte für Mathematik, **174** (2014), 231–258.
- [4] M. Vuorinen, *Conformal invariants and quasiregular mappings*, J. Anal. Math., **45** (1985), 69–115.
- [5] M. Vuorinen, *Conformal geometry and quasiregular mappings*, Lecture note in mathematics, Springer-Verlag, Berlin, 1988.