

UDC 517.54

INTEGRAL MEANS OF HARMONIC MAPPINGSA.S. Kaliraj¹¹ *sairamkaliraj@gmail.com*; Indian Statistical Institute, Chennai, India

In this talk, we are interested to explore more on locally univalent harmonic functions in the perspective of h^p -spaces, which will be helpful in understanding the boundary behaviour and other important aspects of harmonic functions.

Keywords: integral means, locally univalent functions, Hardy spaces.

A function f analytic in the unit disk is said to belong to the Hardy space H^p if the integral means

$$M_p(r, f) = \frac{1}{2\pi} \int_0^{2\pi} |f(re^{i\theta})|^p d\theta$$

is bounded in the unit disk. The finiteness of $M_p(r, f)$ and $M_p(r, f')$ play a crucial role in the classical theory of univalent functions and its upper bound estimate of the following integrals

$$\frac{1}{2\pi} \int_0^{2\pi} |f(re^{i\theta})|^p d\theta \quad \text{and} \quad \frac{1}{2\pi} \int_0^{2\pi} |f'(re^{i\theta})|^p d\theta$$

got special attention when $p = -2, 1, 2$ as it has some applications in free boundary problems in fluid dynamics, and related with the growth of the Taylor coefficients of f . The harmonic Hardy space h^p is the space of functions harmonic on the unit disk that obey the similar integral growth condition for the corresponding Hardy spaces H^p of analytic functions. Until recently, only a few results were known in the literature on h^p -spaces (See [1-3]). In this talk, we are interested to explore more on locally univalent harmonic functions in the perspective of h^p -spaces, which will be helpful in understanding the boundary behaviour and other important aspects of harmonic functions.

This is a joint work with Prof. S. Ponnusamy.

References

1. Duren P. *Harmonic mappings in the plane*, Cambridge Tracts in Mathematics, V. 156. – Cambridge: Cambridge Univ. Press, 2004.
2. Nowak M. *Integral means of univalent harmonic maps* // Ann. Univ. Mariae Curie-Sklodowska, Sect. A. – 1996. – V. 16 (50). – P. 155–162.
3. Ponnusamy S., Sairam Kaliraj A. *On the coefficient conjecture of Clunie and Sheil-Small on univalent harmonic mappings* // Proc. Indian Acad. Sci. Math. Sci. – 2015. – V. 125 (3). – P. 277–290.