

# MOTIVIC OSCILLATION INDEXES OF ARBITRARY IDEALS

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ABSTRACT. In 2006, Budur, Mustața and Saito introduced the notion of Bernstein-Sato polynomials of arbitrary varieties. Recently, in a series of papers, Mustața and Popa studied Hodge ideals and obtain some general properties of roots of the Bernstein-Sato polynomials. Because of the strong monodromy conjecture, it should have a corresponding picture in the arithmetic side of ideals in polynomial rings. In this talk, I will discuss on this problem. Motivated by the Hardy-Littlewood circle method, I will introduce the notions of abstract exponential sums of ideals and motivic oscillation index associated with these exponential sums. In the arithmetic picture, the motivic oscillation index of ideal will play the role of the maximal non-trivial root of the Bernstein-Sato polynomial of ideal. Based on Igusa's conjecture for exponential sums, I propose the averaged Igusa conjecture for exponential sums of ideals. In particular, this conjecture and the motivic oscillation index may have further interesting applications. If the time permits, I will introduce these applications and the idea to prove some variant version of this conjecture.

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