

ON THE SUM OF A PRIME AND A SQUARE IN SHORT INTERVALS

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ABSTRACT: Hardy and Littlewood conjectured that every sufficiently large integer is either a perfect square or a sum of a prime and a square. Recently, Languasco and Zaccagnini (2016) proved an asymptotic formula for the average of the representation function of this conjecture over the short intervals $[X, X + H]$ of length shorter than $X^{1/2} \leq H \leq X$. It is remarkable that their admissible length H is shorter than the preceding results for the related exceptional set estimates. In this talk, we prove that their asymptotic formula still holds for the short intervals of length $X^{0.337} \leq H \leq X$.