On the Largest Axes-Parallel Rectangle among Points in a Square

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Given S, a set of n points contained in the unit square Q = [0, 1]^2, let f(S) denote the area of the largest axes-parallel rectangle that does not contain any of the points of S in its interior. Further, let f(n) be the minimum value of f(S) over all sets S of n points in Q. In 2009, Dumitrescu and Jiang proved that f(2) = (3 −√5)/2, f(4) = 1/4, and the following general bounds for f(n): (1.25 − o(1)) ·1/n ≤ f(n) ≤ 4 ·1/n. We show that f(3) = 0.3079 . . . , 0.2192 < f(5) < 0.2215, and we improve the bounds in the general case: (1.31 − o(1)) ·1/n ≤ f(n) ≤ 1.91 ·1/n.

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