962-35-1284 **Tibor O'dor*** (odor@ms.u-tokyo.ac.jp), Graduate School of Marthematical Sciences, University of Tokyo, 3-8-1 Komaba, Meguro-ku, Tokyo, 153-8914 Japan Tokyo, Japan. *Pompeiu problem and discrepancy theory.*

We measure the irregularities of distribution (discrepancy) of an n element set of k planes $\mathcal{P}_n \subset R^d$ by rotated and translated copies of a fixed convex body K. The body K has the Pompeiu property, if the integral of a continuous function f on the n dimensional Euclidean space vanish on every congruent copy of K then f is zero. The longstanding Pompeiu problem states that only the ball does not have the Pompeiu property. Assuming that K has the so called Pompeiu property and $d-k \geq 2$ we give a $C \cdot n^{\frac{1}{2}-\frac{1}{2(d-k)}}$ lower estimation for the discrepancy of $\mathcal{P}_n$, which is strict, using recent results. Our main result connects discrepancy theory, the theory of Radon tarnsforms, Fourier analisys and overdetermined Neumann problems via the Pompeiu property of the body K. We also discuss a new proof (originally given by T. Kobayashi) for the Pompeiu problem if K is close to a ball. (Received October 03, 2000)