340 [Vol. 31,

79. On Almost Periodic Transformations on Uniform Spaces

By Kiyoshi ISÉKI

Kobe University

(Comm. by K. KUNUGI, M.J.A., June 13, 1955)

In this Note, we shall state some theorems on almost periodic transformations on uniform spaces. W. H. Gottschalk introduced the notion of almost periodic transformation on a topological space X in itself, and W. H. Gottschalk (2), P. Erdös and A. H. Stone (1) obtained some theorems on almost periodic transformations on metric spaces.

Let X be a uniform space, and f a continuous mapping of X in itself.

f is said to be strongly almost periodic if, for a surrounding U, there is an integer N > 0 such that every set of N consecutive integers contains an n satisfying $(x, f^n(x)) \in U$ for all $x \in X$.

f is said to be strongly recurrent, if for any given surrounding U, there is infinitely many n such that $(x, f^n(x)) \in U$.

Then we have the following theorems.

Theorem 1. If a uniformly continuous map f of a uniform space X in itself is strongly recurrent, then so is f^k for every k.

Theorem 2. If a uniformly continuous map f of a uniform space X into itself is strongly almost periodic, then so is f^k for every k.

Theorem 3. If X is a precompact uniform space and if f is a homeomorphism on X such that the family of negative powers of f is uniformly equicontinuous, then f is strongly almost periodic.

References

- 1) P. Erdös and A. H. Stone: Some remarks on almost periodic transformations, Bull. Amer. Math. Soc., **51**, 126-130 (1945).
- 2) W. H. Gottschalk: Powers of homeomorphisms with almost periodic properties, Bull. Amer. Math. Soc., **50**, 222-227 (1944).