

## Werk

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**Proof.** Denote  $S_x = \{(t, t + x) \mid t \in M_x\}$  for a given  $x$  and

$$S = \bigcup_x S_x = \bigcup_x \{(t, t + x) \mid t \in M_x\}.$$

Since  $(t, x) \in S$  if and only if  $t \in M_{x-t}$  and  $M_r, 0 \leq r \leq 1$  are disjoint sets, it is evident that to a given  $t$  there is at most one  $x$  such that  $(t, x) \in S$ .

Denote by  $P : R^2 \rightarrow R$  the projection  $P(t, x) = x$ . Since  $P(S_x) = M_x + x$  and the sets  $M_r + r$  are disjoint, we conclude again that to a given  $x$  there is at most one  $t$  such that  $(t, x) \in S$ .

Finally,  $\{t \mid (t, t + x) \in S\} = \{t \mid t \in M_x\}$  for a given  $x$ ,  $0 \leq x \leq 1$ . Hence  $m^*\{t \mid (t, t + x) \in S\} = m^*(M_x) = 1$  and  $m_*\{t \mid (t, t + x) \in S\} = m_*(M_x) = 0$ .

Let  $F(t, x)$  be defined by

$$\begin{aligned} F(t, x) &= \{0\} \quad \text{for } (t, x) \notin S, \\ F(t, x) &= [0, 1] \quad \text{for } (t, x) \in S. \end{aligned}$$

Then (4.6) to (4.8) imply (0.13) to (0.15).

#### References

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- [4] E. Čech: Point Sets. Academia, Prague 1969.

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