

Definition \mathbb{P} is proper iff \mathbb{II} has a winning strategy in the proper game for every $p \in \mathbb{P}$

The proper game (below $p \in \mathbb{P}$)

\mathbb{I} i_0 with $H_{i_0} \in \text{CON}$... } \mathbb{II} wins iff $\exists \gamma \in \mathbb{P} : \exists t \forall n \ i_n \in \bigcup_{k \leq n} B_k$

\mathbb{II} countable $B_\gamma \subseteq \text{ON} \cap V$... }

Lemma If \mathbb{P} is $G(W)$ or $S(W)$ and u is a non-negative \mathbb{P} -filter, then \mathbb{P} is proper.

Proof:

This is a little twisted: our strategy for \mathbb{II} in the proper game is to build a strategy for \mathbb{I} in the \mathbb{P} -point game. The strategy for the \mathbb{P} -point game is built exactly the way we built it in the previous lemma.

• Fix $p \in \mathbb{P}$

• After playing up to n

\mathbb{I} --- $H_{i_n} \in \text{CON}$ $H_{i_{n+1}} \in \text{CON}$

\mathbb{II} --- B_n (?)

We have built on the side a partial strategy for \mathbb{I} in the \mathbb{P} -point game

\mathbb{I} split(p) ... split($p_{(a_0, \dots, a_n)}$) (?)

\mathbb{II} $a_0 \in \text{split}(p)$... a_{n+1}

as well as $H_{(a_0, \dots, a_i)} \in_f \text{ON} \cap V$

such that $p_{(a_0, \dots, a_i)} \Vdash \dot{a}_i \in H_{(a_0, \dots, a_i)}$

$p_{(a_0, \dots, a_i)} \leq p_{(a_0, \dots, a_j)} \quad \forall i \leq j$

For all possible moves by \mathbb{II} in this \mathbb{P} -point game so far, \dot{a}_i derived from all moves \dot{a}_i in the proper game.

• As before, thanks to the "crucial lemma" this is easy

to continue for every $(a_0, \dots, a_{n-1}) \frown (a_n)$

• So we get $p_{(a_0, \dots, a_n)}$, $H_{(a_0, \dots, a_{n+1})}$ (for all continuations by \mathbb{II})

• Back in the proper game, \mathbb{II} now plays all $H_{(a_0, \dots, a_{n+1})}$:

$B_{n+1} = \bigcup \{ H_{(a_0, \dots, a_{n+1})} \mid (a_0, \dots, a_{n+1}) \text{ a play of } \mathbb{II} \text{ against our partial strategy} \}$

• Of course, B_{n+1} is countable.