M. Hrušák and D. M. Alcántara introduced a Wadge-like game: Let $\mathcal{I}$ and $\mathcal{J}$ be two Borel ideals on ω. The *Comparison game* for $\mathcal{I}$ and $\mathcal{J}$ denoted by $G(\mathcal{I},\mathcal{J})$ plays as follows: In step n, Player I plays $I_n \in \mathcal{I}$, Player II play $J_n \in \mathcal{J}$, Player II wins if $\bigcup_{n\in\omega} I_n$ iff $\bigcup_{n\in\omega} J_n \in \mathcal{J}$. If Player II has a winning strategy, we denote $\mathcal{I} \sqsubseteq \mathcal{J}$. We say that $\mathcal{I} \simeq \mathcal{J}$ if $\mathcal{I} \sqsubseteq \mathcal{J}$ and $\mathcal{J} \sqsubseteq \mathcal{I}$.

In this talk we will brief introduce some known properties of Comparison game, and then answer some questions asked by M. Hrušák and D. M. Alcántara list below:

- Is the order $\sqsubseteq$ linear (a well order)?
- Are there exactly two class of $F_{\sigma\delta}$ non F_σ-ideals?
- How many classes of $F_{\sigma\delta\sigma}$-ideals are there?

To answer these questions, we define a operator on Borel ideal by $T(\mathcal{I})$ is the ideal on ${}^{<\omega}2$ generated by $\{\{x|n : n \in \omega\} : x \in \mathcal{I}\}$. The main result as follows: If $\mathcal{I}, \mathcal{J}$ be two Borel ideals which above $D_\omega(\mathbf{\Sigma}^0_2)$, then $\mathcal{I} \equiv_W \mathcal{J} \Leftrightarrow T(\mathcal{I}) \simeq T(\mathcal{J})$.

References

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