Selective properties of products of Fréchet–Urysohn spaces

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We shall discuss properties of products of countable spaces involving diagonalizations of sequences of their dense subsets. Recall that a space X is *M-separable* if for every sequence $\langle D_n : n \in \omega \rangle$ of dense subsets of X there exists a sequence $\langle F_n : n \in \omega \rangle$ such that $F_n \in [D_n]^{<\omega}$ for all n and $\bigcup_{n\in\omega} F_n$ is dense in X. As it was shown by D. Barman and A. Dow in their papers published in 2011 and 2012, CH implies the existence of two countable Fréchet-Urysohn spaces with non-M-separable product, while PFA implies that all such products are M-separable. The talk will be among others devoted to the following

Theorem. *The existence of two Fréchet–Urysohn spaces with non-M-separable product is consistent with the MA.*

The proof relies on special mad families used to control convergent sequences. Such mad families do not exist under PFA but might exist in models of MA, as shown by A. Dow and S. Shelah in 2012.

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