

# NORM-ATTAINMENT QUESTIONS FOR NUCLEAR OPERATORS AND TENSORS

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ABSTRACT. Let  $X$  and  $Y$  be two Banach spaces. The set of norm-attaining operators from  $X$  to  $Y$ , and whether or not it can be dense, has been widely studied for the last 60 years. In this talk, we will introduce similar norm-attainment concepts adapted to the space of nuclear operators  $\mathcal{N}(X, Y)$ , and also to the projective tensor product space  $X \widehat{\otimes}_\pi Y$ . We will exhibit positive and negative examples of whether or not norm-attainment holds in those cases. We will also study when such norm-attaining elements can be dense, and show that this is the case for many Banach spaces  $X$  and  $Y$  which, in particular, covers all classical Banach spaces (for instance,  $L_p$  spaces,  $L_1$  predual spaces, Banach spaces with a monotone Schauder basis, etc.). However, we also show that there exist spaces  $X$  and  $Y$  for which the norm-attaining elements in  $X \widehat{\otimes}_\pi Y$  are not a dense set.

This talk is based on a joint work with Sheldon Dantas, Mingu Jung and Abraham Rueda Zoca (see [1]). The author was supported by the Spanish Ministerio de Universidades, grant FPU17/02023, and by project MTM2017-83262-C2-1-P/MCIN/AEI/10.13039/501100011033 (FEDER).

## REFERENCES

- [1] Sheldon Dantas, Mingu Jung, Óscar Roldán and Abraham Rueda Zoca, *Norm-attaining tensors and nuclear operators*, Mediterranean Journal of Mathematics **19**(1) (2022), Paper no. 38, 27pp.