

SPECTRAL GAP FOR FULL FACTORS OF TYPE III AND APPLICATIONS

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ABSTRACT. We show that the tensor product $M \overline{\otimes} N$ of any two full factors M and N (possibly of type III) is full and we compute Connes' invariant $\tau(M \overline{\otimes} N)$ in terms of $\tau(M)$ and $\tau(N)$. The key novelty is an enhanced spectral gap property for full factors of type III. Moreover, for full factors of type III with almost periodic states, we prove an optimal spectral gap property. As an application of our main result, we also show that for any full factor M and any non-type I amenable factor P , the tensor product factor $M \overline{\otimes} P$ has a unique McDuff decomposition, up to stable unitary conjugacy. This is joint work with Amine Marrakchi and Peter Verraedt.

REFERENCES

- [HMV16] C. Houdayer, A. Marrakchi, P. Verraedt, *Fullness and Connes' τ invariant for type III tensor product factors*. [arXiv:1611.07914](https://arxiv.org/abs/1611.07914)

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