

**UNIFORM COUNTEREXAMPLES TO THE CONVERGENCE  
PROBLEM FOR PERIODIC DISPERSIVE EQUATIONS WITH  
POLYNOMIAL SYMBOLS**

DANIEL ECEIZABARRENA (BCAM)

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For the free Schrödinger equation, what is the minimum Sobolev regularity for the data such that the solution converges to such data a.e.? We know since 2019 that the right exponent in  $\mathbb{R}^n$  is  $n/(2(n+1))$ . We do not know if changing the dispersion relation alters the result. For example, for the Fourier symbol  $|\xi|^\alpha$  with  $\alpha > 2$  the exponent above is sufficient, but necessary exponents are only known for polynomial symbols and moreover they depend on the symbol itself. In contrast, I will show that in the periodic case the exponent  $n/(2(n+1))$  is actually necessary for the periodic equation with symbol  $|\xi|^{2k}$  with  $k \in \mathbb{N}$  (which corresponds to  $\Delta^k$ ), independently of  $k$ .