Local and global well-posedness for dispersion generalized Benjamin-Ono equations on the circle

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The Cauchy problem for dispersion generalized Benjamin-Ono equations

$$\begin{cases} \partial_t u + \partial_x D_x^a u &= u \partial_x u \quad (t,x) \in \mathbb{R} \times \mathbb{T} \\ u(0) &= u_0 \in H^s_{\mathbb{R}}(\mathbb{T}) \end{cases}$$

is considered on the circle $\mathbb{T} = \mathbb{R}/(2\pi\mathbb{Z})$ for $1 < a < 2$, where $D_x = (-\Delta)^{1/2}$.
The family of equations relates the Benjamin-Ono and the Korteweg-de Vries equation. Previous works on the Cauchy problem include [1,2]. We prove new local well-posedness results for $1 < a < 2$ admitting globalization in $L^2(\mathbb{T})$ provided that $3/2 < a < 2$. The analysis is available at arXiv:1906.01956.

References

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