

# Variable exponent Lorentz spaces

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In this talk we introduce variable Lorentz spaces  $L_{p(\cdot),q(\cdot)}(\mathbb{R}^n)$  and show the identity  $L_{p(\cdot),p(\cdot)}(\mathbb{R}^n) = L_{p(\cdot)}(\mathbb{R}^n)$ . Furthermore, we show that these Lorentz spaces arise by real interpolation between  $L_{p(\cdot)}(\mathbb{R}^n)$  and  $L_\infty(\mathbb{R}^n)$ . Finally we answer in a negative way the question posed by Diening, Hästö and Nekvinda in [DHN04], whether the Marcinkiewicz interpolation theorem still holds in the frame of variable exponent Lebesgue spaces.

## References

- [DHN04] L. Diening, P. Hästö, A. Nekvinda: *Open problems in variable exponent Lebesgue and Sobolev spaces*, Proceedings FSDONA 2004, Academy of Sciences, Prague, 38–52.
- [KV14] H. Kempka, J. Vybíral: *Lorentz spaces with variable exponents*, Math. Nachr. **287** 8-9, (2014) 938–954.