Sujet: **Inverse scattering with partial data**

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The objective of inverse scattering problems consists in determining the structure of an object from scattering data. These problems arise, in particular, in different domains of physics, in chemistry, biology and medicine.

On the mathematical level, inverse scattering problems are often reduced to studies of transforms which map coefficients of differential equations (e.g., Schrödinger equation of quantum mechanics, Helmholtz equation of acoustics or electrodynamics) into scattering data. In many cases these transforms can be considered as non-linear analogues of the classical Fourier transform and reduce to the later one in the Born approximation.

These problems have a long history; see [4]. Nevertheless, in recent years strong advancements were obtained, in particular, in inverse scattering problems with partial data (e.g., in phaseless inverse scattering, passive imaging, super-resolution, and partial invisibility); see [1]-[4] and references therein.

The purpose of this project consists in developing studies on inverse scattering with partial data.

References

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[3] M. Isaev, R.G. Novikov, G.V. Sabinin, Super-resolution reconstruction from truncated Fourier transform, hal-04059509
[4] R.G. Novikov, Multidimensional inverse scattering for the Schrödinger equation, Springer Proc. Math. Stat., 385, 75–98 (2022)