

Finite gap solutions for BKM-Systems

Abstract

BKM systems were introduced in [Bolsinov et al., 2022] by Bolsinov, Konyaev and Matveev as a consequence of the program on Nijenhuis geometry. They are integrable evolutionary PDEs (with differential constraints, depending on the type I-IV of the BKM system) including many famous examples like KdV, Camassa-Holmes etc. In [Bolsinov et al., 2024] so-called finite gap type solutions were constructed using solutions of some ODEs corresponding to geodesically equivalent metrics. This allows one to find particular solutions of the PDEs by means of solving (numerically or analytically) some ODEs. We will explain this construction, show some simulations and -if time allows- derive some explicit analytical solutions to some example BKM systems.

References

- Alexey V Bolsinov, Andrey Yu Konyaev, and Vladimir S Matveev. Applications of nienhuis geometry iv: multicomponent kdv and camassa-holm equations. *arXiv preprint arXiv:2206.12942*, 2022.
- Alexey V Bolsinov, Andrey Yu Konyaev, and Vladimir S Matveev. Finite-dimensional reductions and finite-gap type solutions of multicomponent integrable pdes. *arXiv preprint arXiv:2410.00895*, 2024.