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Integrable maps from deformations of cluster mutations

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We consider parametric deformations of sequences of cluster mutations in the framework of cluster algebras, which destroy the Laurent property but preserve the presymplectic structure defined by the exchange matrix. In the case of non-degenerate exchange matrices parametric symplectic maps are derived. We will study the Liouville integrability of such maps by imposing suitable constraints on the parameters. We will also consider examples of more general types of mutations, involving fractional linear transformations, that for some particular affine type exchange matrices lead to periodic reductions of the discrete sine-Gordon equation.

References

- [1] A.N.W. Hone, T.E. Kouloukas “Deformations of cluster mutations and invariant presymplectic forms”, arXiv:2107.11866v1 (2021).