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Elliptic deformations of quantum Virasoro algebras

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We present the construction of deformed Virasoro algebras (DVA) from elliptic quantum algebras (the latter being particular Drinfel'd twists of the quantum affine algebras $U_q(\widehat{\mathfrak{gl}}_N)$). In both cases, vertex and face-type elliptic quantum algebras, we identify generating functionals that satisfy exchange relations with the Lax matrices defining the elliptic algebra under certain conditions, in particular for the critical value of the central charge. These generating functionals, constructed as quadratic trace-like objects in terms of the Lax matrices, give rise to deformed Virasoro algebras. The obtained structures are characterized as extended centers at the critical value of the central charge and define abelian subalgebras of the elliptic quantum algebras when additional conditions on the parameters are imposed. The Poisson structures as limits of DVA are also derived, recovering the original classical DVA in particular cases.

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