Matrix divisors and Chevalley groups

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Abstract. Matrix divisor is the historically first equivalent of the notion of holomorphic G-bundle on a Riemann surface. Matrix divisors have been introduced by A.Weil (1938), and later considered by A.Grothendieck in his talk at the Bourbaki seminar (1957), and by A.N.Tyurin (1964-65).

Matrix divisors can be defined as 0-cochains on the Riemann surface with coefficients in a Chevalley group over the field of rational functions. Based on this definition, we propose canonical form of a matrix divisor and find out moduli of matrix divisors.

By Riemann-Roch theorem, in the case G is simple, the dimension of the moduli space of stable G-bundles is equal to $(\dim G)(g-1)$ where g is genus of the Riemann surface. For the classical series of root systems, and for G_2, we present the moduli space of matrix divisors of the same dimension and conjecture that these are exactly the divisors of stable bundles.

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