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Neal Livesay* (nlives1@lsu.edu). *Moduli spaces of irregular singular GSp -connections.*

A fundamental problem in the study of differential equations is the classification of first-order singular differential operators up to gauge equivalence. A modern version of this problem, rephrased in the language of algebraic geometry, involves the construction of moduli spaces of meromorphic G -connections (or, equivalently, flat G -bundles) on $\mathbb{C}\mathbb{P}^1$, for G a reductive group. P. Boalch (2001) has constructed moduli spaces for GL_n -connections in the case that the connection matrix at each singularity — an element of the formal loop algebra $\mathfrak{gl}_n(\mathbb{C}((z)))$ — is diagonalizable. More recently, C. Bremer and D. Sage (2012) have used representation-theoretic methods to develop a new approach to studying G -connections. Furthermore, they have used this approach to construct moduli spaces of GL_n -connections with certain classes of non-diagonalizable connection matrices (such as the generalized Airy connection matrices). In this talk, I will describe my recent work to further extend this theory for the study of GSp_{2n} -connections, and demonstrate the theory for some small rank examples. (Received January 17, 2017)