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Shift operators and Riemann's problem

For a Fuchsian system of ordinary differential equations, a shift operator is a gauge transformation that sends the system to another Fuchsian system with the same monodromy and with the local exponents shifted by integers. For the rigid case, the existence of shift operators is shown by Oshima [2, Chapter 11]. By calculating a non-rigid example, I find, in the case, that a shift operator always exists for any shift and it gives a birational transformation of the accessory parameters. We are going to generalize this result for any Fuchsian systems. The existence of shift operators is equivalent to the existence of shifted Fuchsian systems, and hence is closely related to Riemann's problem. We find that the theory of Lappo-Danilevsky [1] works to solve this problem. I would like to report what we have done.

REFERENCES

- [1] J. A. Lappo-Danilevsky, *Mémoires sur la théorie des systèmes des équations différentielles linéaires*, Chelsea Publishing Company, 1953.
- [2] T. Oshima, Fractional calculus of Weyl algebra and Fuchsian differential equations, *MSJ Memoirs*, **28**, 2012.