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Constanze Liaw*, One Bear Place #97328, Waco, TX 76798, and **Sergei Treil**. *Finite rank unitary perturbations*.

The unitary perturbations of a given unitary operator by finite rank d operators can be parametrized by $d \times d$ unitary matrices; this generalizes the rank $d = 1$ setting, where the Clark family is parametrized by the scalars on the unit circle. For finite rank perturbations we investigate the functional model of a related class of contractions, as well as a (unitary) Clark operator that realizes such a model representation for a particular contraction. We find a universal representation of the adjoint of the Clark operator, which features a matrix-valued Cauchy integral operator. By universal we simply mean that our formula is given in the coordinate free Nikolski–Vasyunin functional model.

We express the matrix-valued characteristic functions of the model (for the class of contractions). Unlike in the case of rank one perturbations, these characteristic functions do not seem to be related via a linear fractional transformation. In the case of inner characteristic functions results suggest a generalization of the normalized Cauchy transform to the finite rank setting.

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