1176-65-78 **Vladimir Druskin*** (vdruskin@wpi.edu), **Shari Moskow** and **Mikhail Zaslavsky**.

"Lippmann-Schwinger-Lanczos algorithm for inverse scattering problems.

Data-driven reduced order models (ddROMs) are combined with the Lippmann-Schwinger integral equation to produce direct and iterative nonlinear inversion methods. The ROM is viewed as a Galerkin projection and is sparse due to Lanczos orthogonalization. It corresponds to a the orthogonal polynomial with respect to a data-driven spectral measure. Embedding into the continuous problem, a data-driven internal solution is produced. This internal solution is then used in the Lippmann-Schwinger equation, in direct or iterative framework. The new approach allows us to process non-square matrix-valued data-transfer functions, i.e., to remove the main limitation of the earlier versions of the ddROM inversion algorithm. (Received January 13, 2022)