1003-20-1214   **Eric J. Malm*** (`emalm@hmc.edu`), 340 E. Foothill Blvd., Claremont, CA 91711-3116.
Decimation-in-frequency Fast Fourier Transforms for the Symmetric Group. Preliminary report.

The discrete Fourier transform provides a way to convert samples of a periodic function into frequency information about that function, and consequently underlies much of modern signal processing theory. In recent years, significant attention has been paid to group-theoretic generalizations of the discrete Fourier transform and to their efficient implementation. Much of the current research in generalized fast Fourier transforms for the symmetric group S_n has focused on separation of variables (decimation-in-time) algorithms. These approaches require complex combinatorial indexing schemes to achieve efficient performance. Projection-based (decimation-in-frequency) algorithms promise to afford both a theoretical framework for such FFTs and a means of realizing their implementations. We discuss our recent results in the development of such decimation-in-frequency FFT algorithms on S_n. (Received October 04, 2004)