

Abstract Submitted
for the OSF07 Meeting of
The American Physical Society

Evaluating the Karhunen-Loeve Transform for SETI¹ YURU NIU,
DANIEL FLEISCH, Wittenberg University — One of the significant challenges in
the Search for Extraterrestrial Intelligence (SETI) is the detection and identifica-
tion of unusual signals. Traditional signal-processing techniques employing the Fast
Fourier Transform (FFT) are very effective for extracting sinusoidal signals from
noise and interference, but are less effective for non-sinusoidal signals. Some SETI
researchers have suggested that the Karhunen-Loeve Transform (KLT) is well-suited
to detecting signals with unknown characteristics. To evaluate this possibility, we
have built a MATLAB simulation that allows us to synthesize a variety of signals
and then apply both FFT and KLT processing. Initial results indicate that the KLT
is more effective than the FFT for detecting signals with low signal-to-noise ratio
and significantly outperforms the FFT for non-sinusoidal signals.

¹This work was supported in part by Wittenberg University.

Daniel Fleisch
Wittenberg University

Date submitted: 28 Sep 2007

Electronic form version 1.4