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# A Random Matrix--

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# Theoretic Approach to Handling Singular Covariance Estimates

Thomas L.  
Marzetta,  
Gabriel H. Tucci,  
Steven H. Simon

*(Submitted on 4  
Oct 2010)*

In many  
practical  
situations  
we would  
like to  
estimate  
the  
covariance  
matrix of  
a set of  
variables  
from an  
insufficient  
amount  
of data.  
More  
specifically,  
if we  
have a  
set of  
 $N$   
independent,  
identically  
distributed  
measurements  
of an  
 $M$   
dimensional

random  
vector  
the  
maximum  
likelihood  
estimate  
is the