Looking closely at equation, we find that each of the Krylov basis vectors is a weighted sum of the eigenvectors which is similar to PC. In fact if all the resulting rank compression is same as PC. Since these weight values are the function of both eigenvalue and the cross correlation coefficient then the MWF rank will always be less than or equal to the PC rank because any dimension reduction due to will be over and above the dimension reduction due to .

If then all N Krylov basis vectors are kept and the full N dimensional space is spanned. But if then the Krylov subspace dimension can be reduced based on low eigenvalue , low correlation , or a combination of both.

In practice, it is observed that environment with low power interferers are well handled by MWF rank compression due to the low product. Environments with closely spaced interference sources are also good candidate for MWF because their close proximity creates a bifurcation into a dominant eigenvector and a weak one. These weaker eigenvectors becomes additional candidates for rank compression.

xiv. Rank compression of the unconstrained MWF

1. Note: Krylov expansion
2. Begin with and where is weight factor that corresponds to the correlation between the Eigen vector of the received data and the desired signal.
3. so
4. but
5. so
6. and all higher Krylov basis is defined
7. From above we see that all Krylov basis vectors are weighted Eigen vectors where the weighting values are function of the Eigen values (i.e. Eigen vector power) and the correlation of that Eigen vector with the desired signal.
8. Therefore any MWF rank compression will be equal or greater than its PC counterpart because any dimension reduction in will be equal to greater than the dimension reduction from ; therefore will always be true.