This code is built based on the VALSE algorithm, and is written by Jiang Zhu, Qi Zhang and Xiangming Meng. If you have any problems about the code, please feel free to contact [jiangzhu16@zju.edu.cn](mailto:jiangzhu16@zju.edu.cn)

Please directly run NMSEvsIter to see the performance of the GL\_QVBCE.

Main function：

Out=CE\_VALSE\_EP\_all(y\_q,m,ha,T,pilot,h\_orig,yy\_min,B,alpha,Iter\_max,method\_EP)

Input parameters：

y\_q：For quantization, it belongs to $0,1,2,\cdots,2^B-1$. For unquantized setting, it is the unquantized measurmenets.

m: The index correspond to incomplete measurements.

ha: Set ha=2, which corresponds to Heuristic 2

T: The number of pilots

h\_orig: True channel (spectral signal)

Iter\_max：The maximum number of iterations

B: The bit-depth. For unquantized setting, set B=inf.

yy\_min: The left endpoints of the quantizer

alpha: The stepsize of the quantizer

method\_EP：'diag\_EP' or scalar\_EP’. Please set 'diag\_EP'.

Output parameters

out=struct('freqs',th,'amps',w(s),'x\_estimate',xr,'noise\_var',nu,'iterations',t,'MSE',mse,'K',Kt);

freqs: The point estimates of the frequency

amps: The complex weight amplitude

xr：Reconstructed channel (line spectral)

noise\_var: noise variance estimate

t: The iterations exited

MSE：Normalized MSE

K: Tracking the number of paths during iteration