**Supplementary Document**

**Algorithm of BiCG (Bank and Chan, 1994; Ortega *et al.*, 2013)**

; Limit of iteration number

Choose  or  for initial 

; Initial residual vector

; Initial search vector

 Conjugate Transpose of the residual vector

 Conjugate Transpose of the search vector





; The coefficient for bi-orthogonality relation

; The updated x per each iteration

; The updated conjugate transpose of x per each iteration

; The updated sequences of the residual per each iteration number

; The updated sequences of conjugate transpose of residual per each iteration



; Gram-Schmidt constant

; The updated sequences of search vectors per each # of iter.

; The updated sequences of conjugate transpose of search vectors per each iteration



**Algorithm of TFQMR (Freund, 1993)**

Choose  or  for initial 

Set initial vectors and parameters;















Limit of iteration number

For use of MATLAB, many parameters are arranged as structure arrays.

Choose  such that 



;

;

;

 The reference algorithm has been adapt for MATLAB.

;

;

;

;

 These segment is arranged for MATLAB.



 These segment is arranged for MATLAB.





;

;



;

;

;

;

