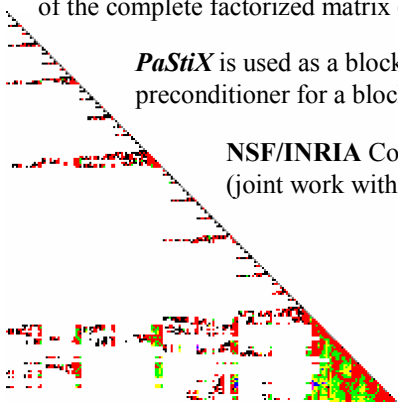


From complete to incomplete factorization

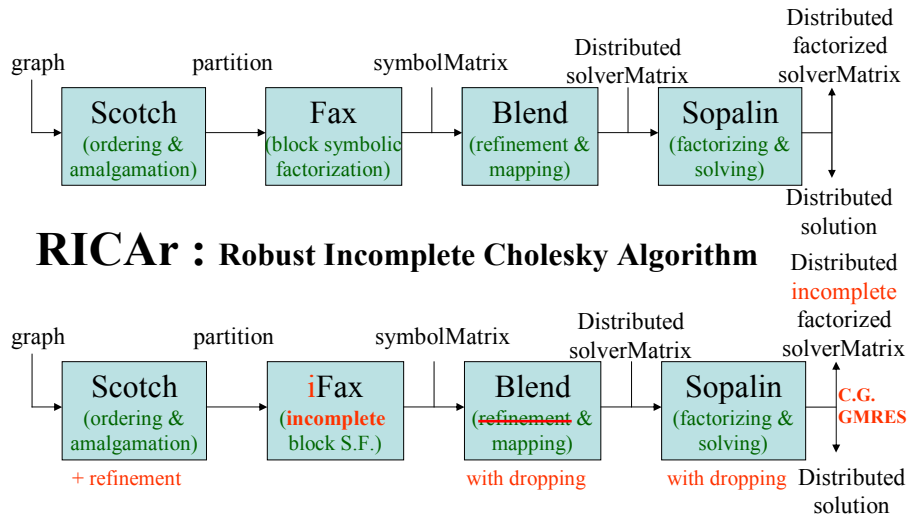
Main idea: we want to compute the block structure of the preconditioner (iBS) from the block structure of the complete factorized matrix (BS)

PaStiX is used as a block ILU(k) preconditioner for a block iterative solver

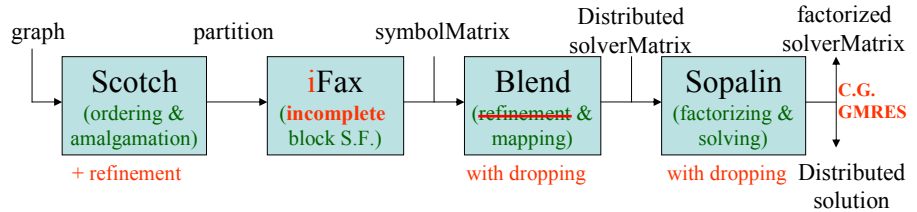
NSF/INRIA Collaboration
(joint work with Y. Saad)



PaStiX : Parallel Sparse matrix solver

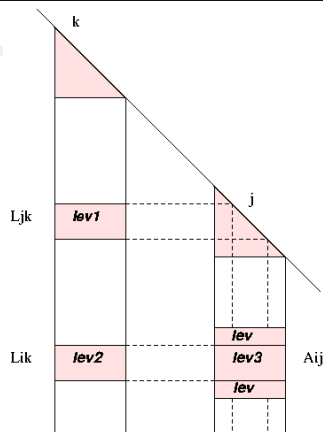


RICAr : Robust Incomplete Cholesky Algorithm



Strategy for dropping

- For each block of BS, we can compute « in quasi linear time » criteria such that:
 - the level-of-fill during block elimination
 - $lev_3 = \min(lev, lev1+lev2+1)$
 - the number of updates during factorization
- We can combine several criteria to **drop blocks** from BS



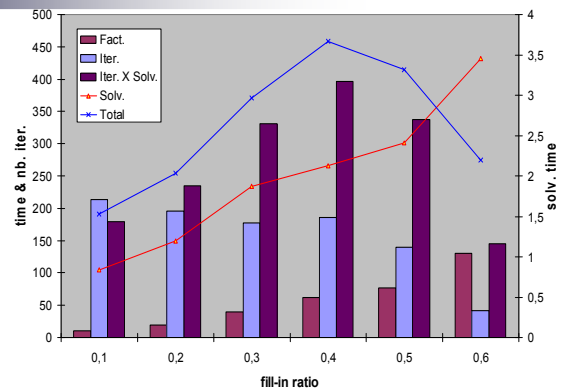
Time and convergence

AUDI test case
1 SMP (16 procs)

blocksize=16
stop criterion= 10^{-8}

fill-in set to 10%:
 $5 \times NNZ_A$
iter=214
fact=11s
total=190s

(direct solver: 472s)



Articles in journal

Parallel Computing, 28(2):301-321, 2002. P. Hénon, P. Ramet, J. Roman

Conference's articles

LA'2003, Williamsburg, Virginia, USA, July 2003. P. Hénon, P. Ramet, J. Roman

PPSC'2004, San Francisco, California, USA, February. 2004. P. Hénon, F. Pellegrini, P. Ramet, J. Roman

PARA'2004, Copenhagen, Denmark, June 2004. P. Hénon, F. Pellegrini, P. Ramet, J. Roman



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