



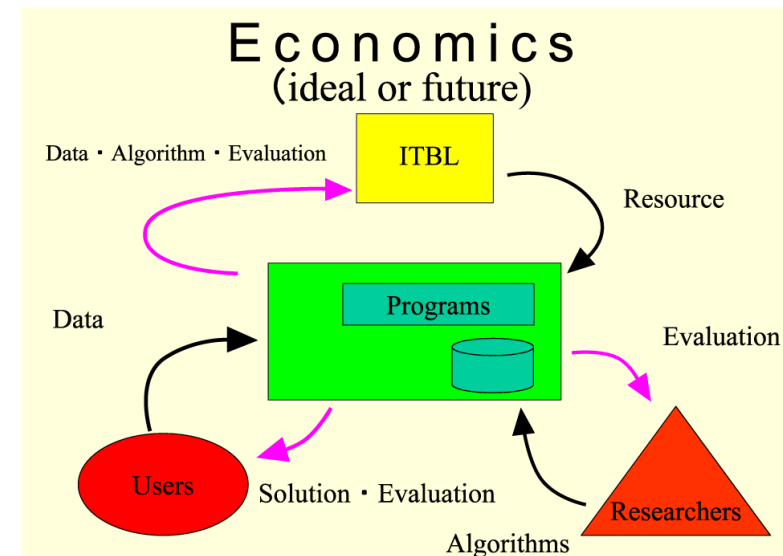
TiS: Test of Iterative Solvers

- Tool for finding appropriate preconditioner and iterative solver of Krylov subspace methods for a given Equation $Ax = b$ with no programming effort.
- Public computation service via ITBL portal (at any time, at anywhere, with no charge)
- Utilizing given problems for future development
- Making a new research community

For Users: Tell an appropriate solver and preconditioner to their problem

For Researchers: Give a chance to evaluate their solvers by many data

For ITBL: Give evaluation results of program and data

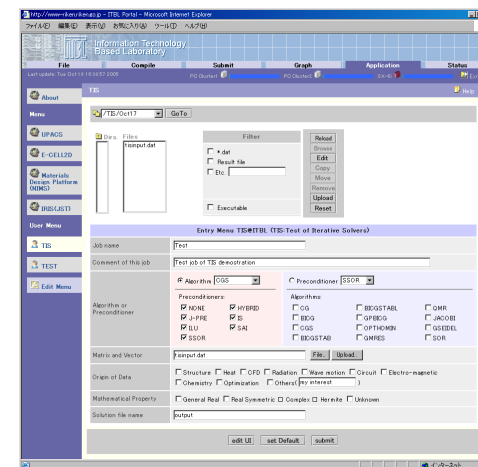




Solvers and Preconditioners

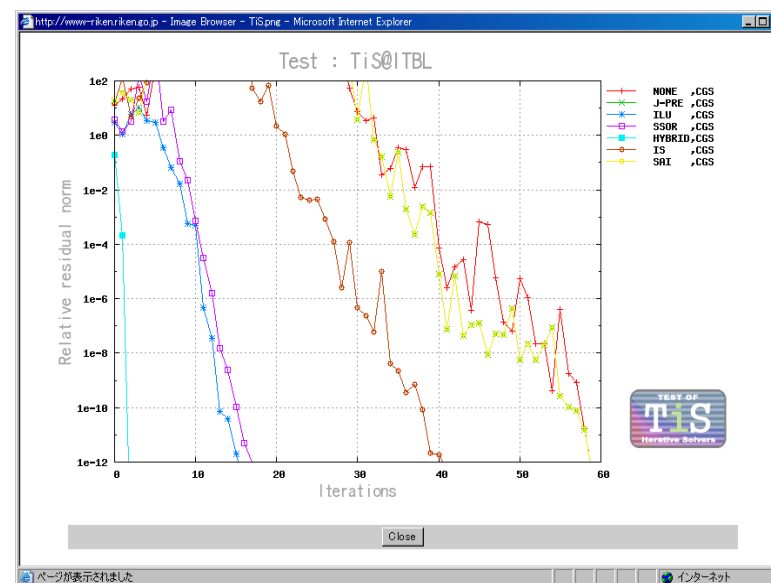
- BiCG
- CGS
- BiCGSTAB
- BiCGSTAB(I)
- GPBiCG
- GMRES(k)
- QMR
- Jacobi
- Gauss-Seidel
- SOR

- No
- Scaling
- Jacobi
- Incomplete LU
- SSOR
- Hybrid
- I+S type
- SAINV



Users may upload their data to ITBL Portal and select combinations of solvers and preconditioners via a menu (upper-right).

Later, users will get a comparison chart (right) and computed solutions via ITBL Portal.





How to provide own data to TiS

For a given problem $Ax=b$, a selection of Iterative solver and Pre-conditioner is important but not easy. We provide TiS which is a tool to support such selection for the real problem on ITBL Portal. The main purpose is “Ease of Use”, “Not require any special knowledge”.

The coefficient matrix and right-hand side are based on the MatrixMarket's format. They are text data. N is dimension, NNZ is number of Non-Zero elements:

(1) % comment	(2) % comment	(3) % comment
N, NNZ	N, NNZ	N, NNZ
$i, j, a_{i,j}$	b	b
b	$\{x_0\}$	$i, j, a_{i,j}$
$\{x_0\}$	$i, j, a_{i,j}$	$\{x_0\}$

Currently, Size of Data must be no larger than 700MB (almost one CD-R). In this size, it can be solved that a 3D problem discretized by FDM with $N_x = N_y = N_z = 100$ whose dimension is one million 10^6 .



TiS supports your selection of solver and preconditioner

It may be impossible that a certain preconditioner and iterative solver is the best for any problem. It may be impossible to find the best preconditioner and iterative solver without actual computation. There are almost no support to find an appropriate preconditioner and iterative solver for public use.

TiS helps you to select an appropriate iterative solver and preconditioner for your problem. TiS will be useful at following cases:

- Before choosing an appropriate algorithm
- For checking the correctness of the code
- For analyzing the property of your data
- For requesting a new algorithm
- To complete your homework quickly!

