Сравнение быстродействия реализованных методов решения слау

|  |  |  |  |
| --- | --- | --- | --- |
| Метод | 100х100 | 200х50 | 50х200 |
| direct | 0:00:00 | 0:00:00 | сбой |
|  |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Метод | 200х200 | 400х100 | 100х400 |
| direct | 0:00:12 | 0:00:12 | сбой |
|  |  |  |  |
|  |  |  |  |

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=2 | Congruate Gradient  1e-12 |
| 100x100 | 0:00:00 | 0:00:02 |  |
| 200x200 | 0:00:12 | 0:00:16 |  |
| 253x253 | 0:00:30 | 0:00:39 |  |
| 400x400 | 0:03:09 | 0:03:59 |  |
| 800x800 | Out of memory | 0:71:37 |  |

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix  \*) | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=1 \*\*) | Congruate Gradient  1e-12  \*) |
| 100x100 | 0:00:00 | 0:00:01 | 0:00:01 |
| 200x200 | 0:00:12 | 0:00:07 | 0:00:03 |
| 253x253 | 0:00:30 | 0:00:16 | 0:00:04 |
| 400x400 | 0:03:09 | 0:01:31 | Out of Memory |
| 800x800 | Out of memory | 0:15:35 | Out of Memory |

\*) Delphi xe8 x32 compiller. Out of memory баг компилятора.

\*\*) Visual Studio 2013 Ultimate x32 compiller.

my\_amg time

|  |  |  |
| --- | --- | --- |
| Dimension | Time | Comment profile |
| 800x800 | 0:71:37 | 50% ic<2, |
|  | 0:26:07 | Ic<=1 |
|  | 0:23:15 | -10% |
|  | 0:15:35 |  |
|  | 0:14:53 | 4102 |
|  | 0:09:32 |  |

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix  \*) | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=1 \*\*) | Congruate Gradient  1e-12  \*) |
| 100x100 | 0:00:00 | 0:00:00:935 | 0:00:01 |
| 200x200 | 0:00:12 | 0:00:03:677 | 0:00:03 |
| 253x253 | 0:00:30 | 0:00:07:792 | 0:00:04 |
| 400x400 | 0:03:09 | 0:00:37:466 | Out of Memory |
| 800x800 | Out of memory | 0:10:11 | Out of Memory |
| 1000 x 1000 | Out of memory | 0:20:01  0:07:22 | Out of memory |
| 40 x 40 x 40 | Out of memory | 0:00:17 | Out of memory |
| 60 x 60 x 60 | Out of memory | 0:02:18 | Out of memory |
| 80 x 80 x 80 | Out of memory | 0:09:48 | Out of memory |

\*) Delphi xe8 x32 compiller. Out of memory bag compiller.

\*\*) Visual Studio 2013 Ultimate x32 compiller. При нумерации неизвестных соответствующей минимальной ширине ленты.

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

Fred Gustavson matrix multiplyer algorithm.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix  \*) | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=1 \*\*) | Congruate Gradient  1e-12  \*) |
| 100x100 | 0:00:00 | 0:00:00:894 | 0:00:01 |
| 200x200 | 0:00:12 | 0:00:02:121 | 0:00:03 |
| 253x253 | 0:00:30 | 0:00:03:705 | 0:00:04 |
| 400x400 | 0:03:09 | 0:00:14:686 | Out of Memory |
| 800x800 | Out of memory | 0:03:03 | Out of Memory |
| 1000 x 1000 | Out of memory | 0:07:22 | Out of memory |
| 40 x 40 x 40 | Out of memory | 0:00:11:315 | Out of memory |
| 60 x 60 x 60 | Out of memory | 0:01:20 | Out of memory |
| 80 x 80 x 80 | Out of memory | 0:06:16 | Out of memory |

\*) Delphi xe8 x32 compiller. Out of memory bag compiller.

\*\*) Visual Studio 2013 Ultimate x32 compiller. При нумерации неизвестных соответствующей минимальной ширине ленты.

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

Fred Gustavson matrix multiplyer algorithm.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix  \*) | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=1 \*\*) | Congruate Gradient  1e-12  \*) |
| 100x100 | 0:00:00 | 0:00:00:899.162 | 0:00:01 |
| 200x200 | 0:00:12 | 0:00:01:721 | 0:00:03 |
| 253x253 | 0:00:30 | 0:00:02:918 | 0:00:04 |
| 400x400 | 0:03:09 | 0:00:8:058 | Out of Memory |
| 800x800 | Out of memory | 0:01:18 | Out of Memory |
| 1000 x 1000 | Out of memory | 0:03:03  Analog:  Cusp 58s  ViennaCL 42s  CULA 2s  GAMPACK 0.8s  Amg1r5 13s | Out of memory |
| 1300 x 1300 | Out of memory | 0:07:48 | Out of memory |
| 40 x 40 x 40 | Out of memory | 0:00:10:348 | Out of memory |
| 60 x 60 x 60 | Out of memory | 0:01:07 | Out of memory |
| 80 x 80 x 80 | Out of memory | 0:04:55 | Out of memory |

\*) Delphi xe8 x32 compiller. Out of memory bag compiller.

\*\*) Visual Studio 2013 Ultimate x32 compiller. При нумерации неизвестных соответствующей минимальной ширине ленты.

Work time statistics for Puasson problem in 2.6GHz one thread processor. x32 programm compilation.

Fred Gustavson matrix multiplyer algorithm.

|  |  |  |  |
| --- | --- | --- | --- |
| Dimension of rectangle Puasson problem | Direct method for banded matrix  \*) | Classical aglomeration algebraic multigrid method base the standart interpolation  Ic<=1 \*\*) | Congruate Gradient  1e-12  \*) |
| 100x100 | 0:00:00 | 0:00:00:899.162 | 0:00:01 |
| 200x200 | 0:00:12 | 0:00:01:721 | 0:00:03 |
| 253x253 | 0:00:30 | 0:00:02:918 | 0:00:04 |
| 400x400 | 0:03:09 | 0:00:8:058 | Out of Memory |
| 800x800 | Out of memory | 0:01:18 | Out of Memory |
| 1000 x 1000 | Out of memory | 0:03:03  00:03:30  00:02:54  00:02:49  00:02:18  00:01:40  00:01:51  Analog:  Cusp 58s  ViennaCL 42s  CULA 2s  GAMPACK 0.8s  Amg1r5 13s | Out of memory |
| 1300 x 1300 | Out of memory | 0:07:48 | Out of memory |
| 40 x 40 x 40 | Out of memory | 0:00:10:348 | Out of memory |
| 60 x 60 x 60 | Out of memory | 0:01:07 | Out of memory |
| 80 x 80 x 80 | Out of memory | 0:04:55  00:13:35  00:06:04  00:05:34 | Out of memory |

\*) Delphi xe8 x32 compiller. Out of memory bag compiller.

\*\*) Visual Studio 2013 Ultimate x32 compiller. При нумерации неизвестных соответствующей минимальной ширине ленты.