

A Historical Time Line of deal.II

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The gray ages, early years, and pre-deal.II era:

Guido:

- Diploma thesis in Bonn, 1992, writes some codes together with Franz-Theo Suttmeier; thoughts about adaptive meshes
- Both move to Heidelberg in 1993, work on a common library called DEAL (Differential Equations Analysis Library) that solves PDE with mixed triangular/quadrilateral meshes in 2D with hanging nodes, only bilinear elements
- Basis for early Dual Weighted Residual error estimation work in Rannacher's group
- Guido and Roland Becker add a multigrid component
- No templates, complicated data structures for mixed tri/quad meshes lead to difficult and error prone code base
- Poor software design (little documentation, no assertions, no test cases) make programming rather hard

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The gray ages, early years, and pre-deal.II era:

Wolfgang:

- Comes to Rannacher's group in 1996, to work on fluid flow simulations
- Finite element software course with Guido and F.-T. Suttmeier in 1997; creates the Point<dim> class, but makes all other mistakes one can make with FE software
- Some contact with DiffPack, creates a clone of their parameter file handling class (still exists as ParameterHandler class)
- Doesn't particularly like what he hears about DEAL
- Starts to write deal.II in December 1997
- Writes his diploma thesis in 1998 on adaptive finite element simulations of the wave equation

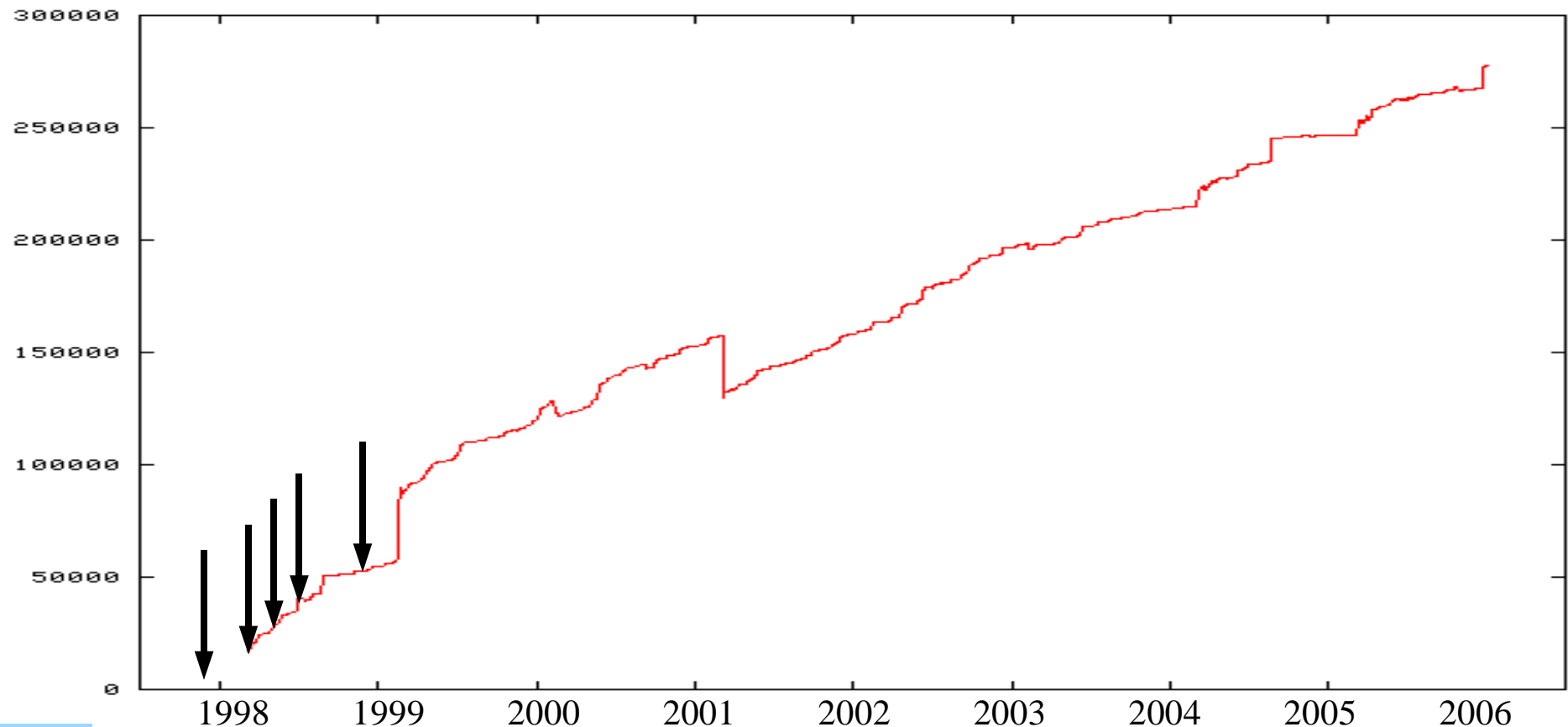
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The gray ages, early years, and pre-deal.II era:

Ralf:

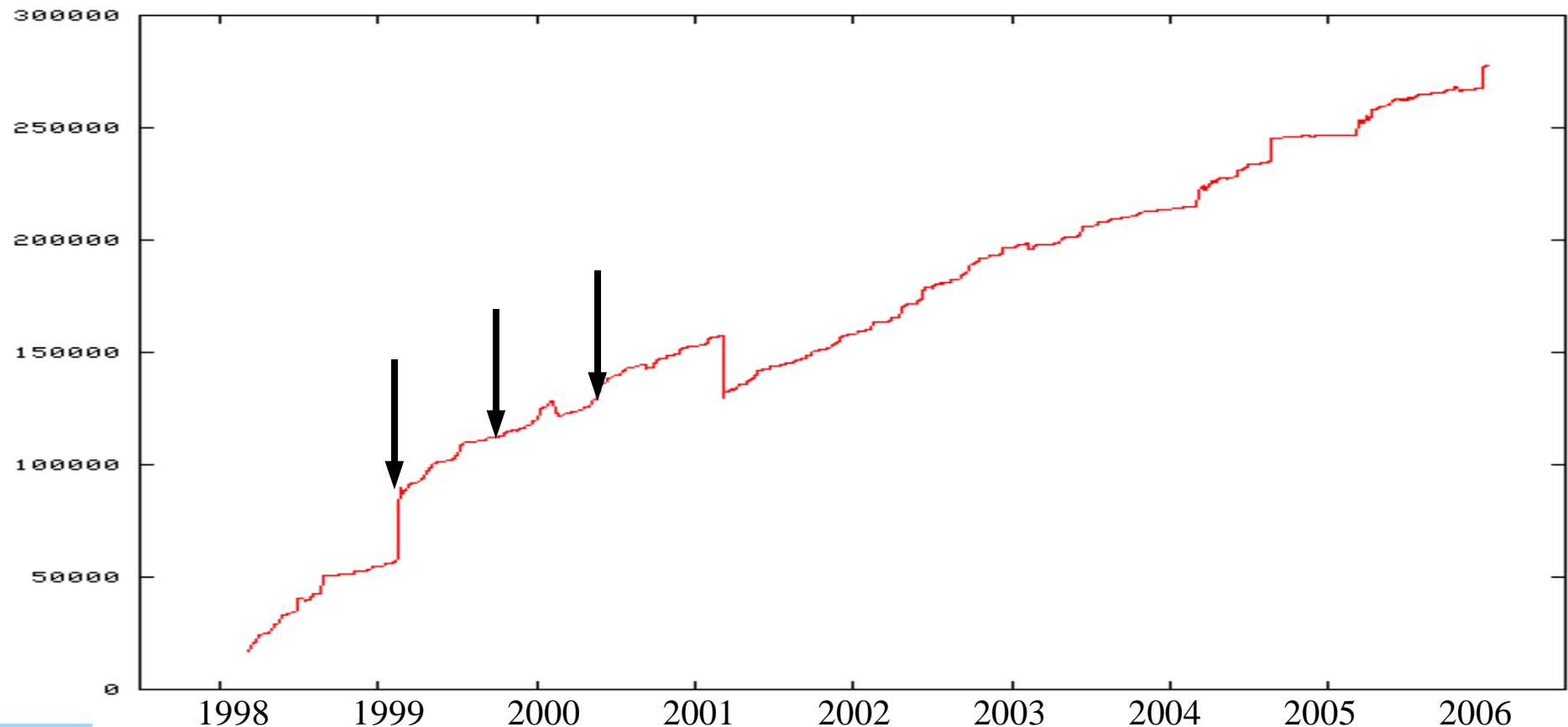
- Comes to Rannacher's group in 1997
- Finite element software course with Guido and F.-T. Suttmeier in 1997; also makes all mistakes one can make with FE software
- Then writes his Diploma thesis with DEAL in 1998 on adaptive finite element simulations of the heat equation
- Starts to use deal.II in 1999 for his PhD thesis

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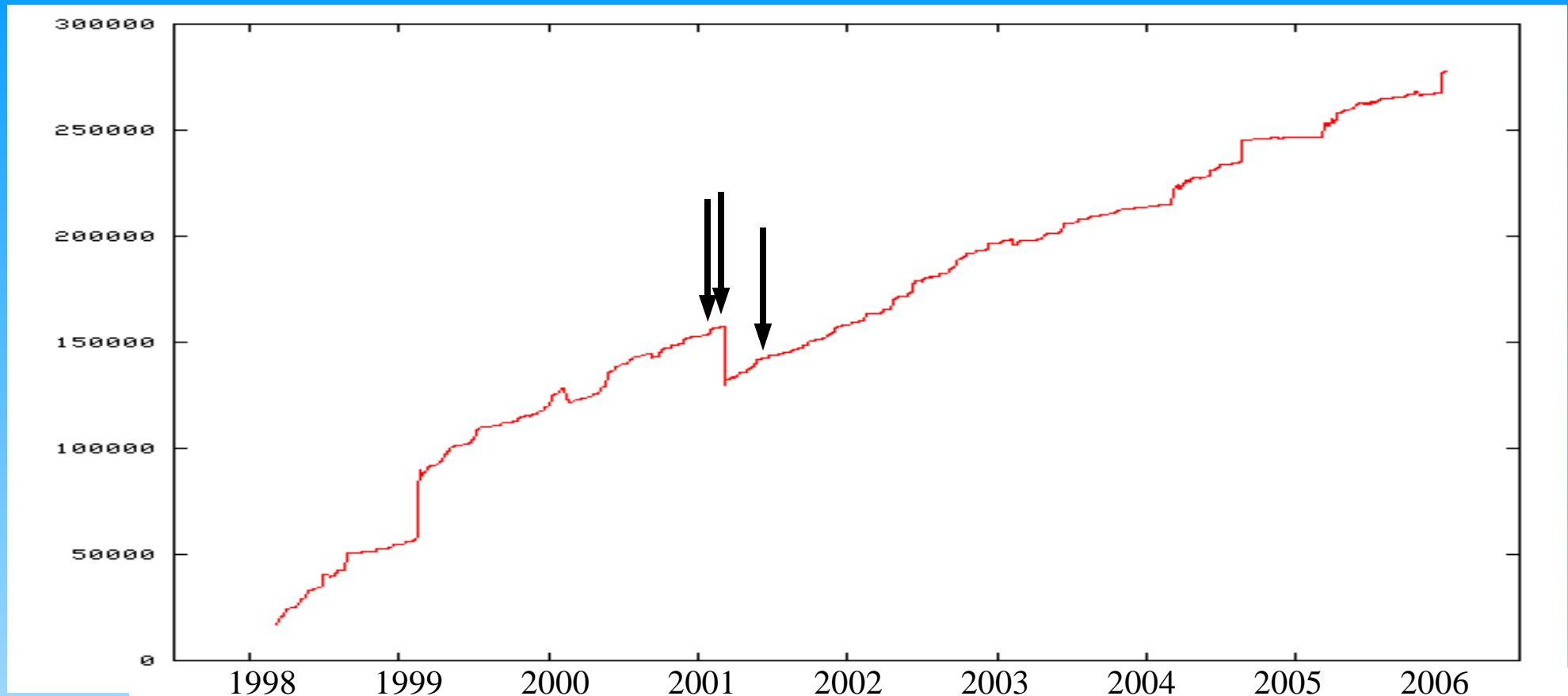
- December 1997: Start of project
- 1998/03/06: First CVS repository with already some 17,000 lines of code
- 1998/06/26: First version of bi-quadratic finite elements; cubic and quartic ones follow soon during a phase of depression
- August 1998: Guido contributes not only his expertise, but also codes
- 1998/12/18: Ralf contributes first code

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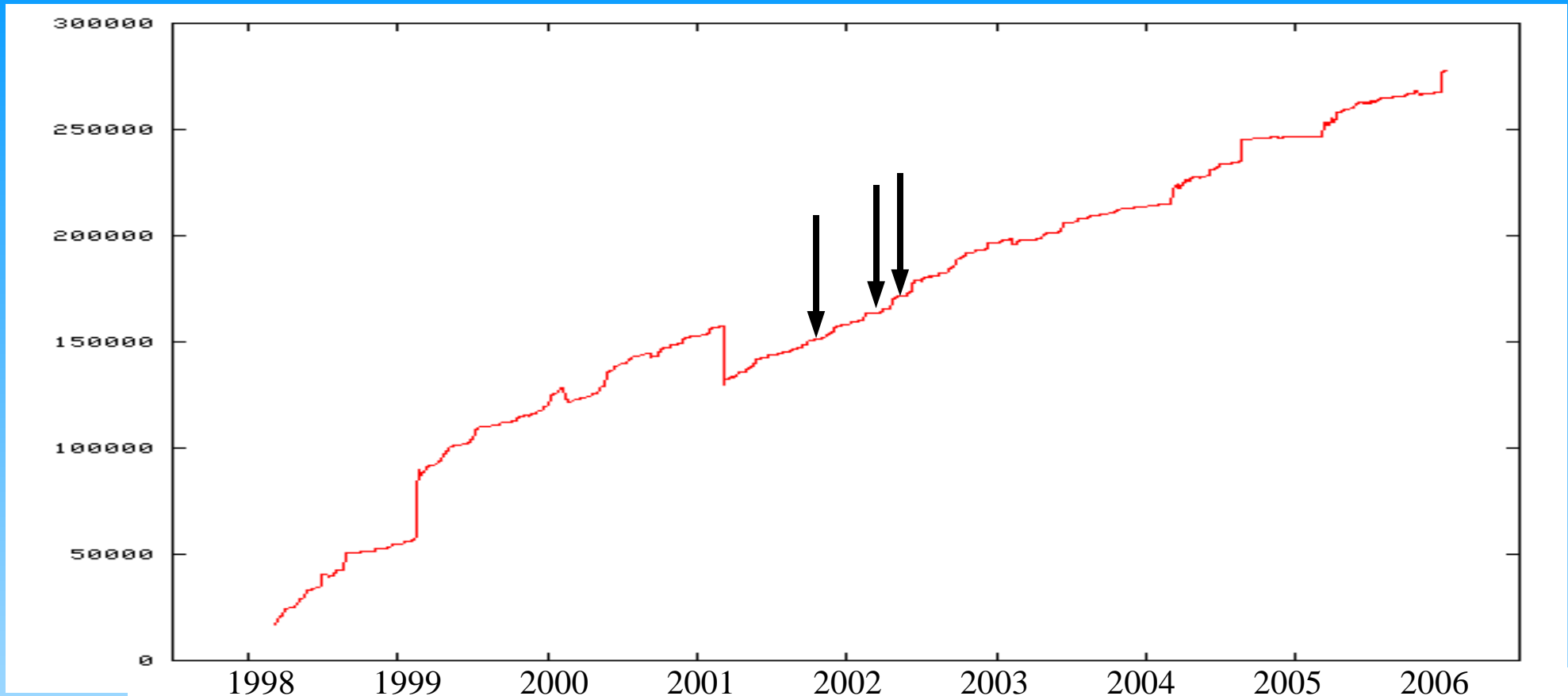
- 1999/2/16: Wolfgang merges the 3d components that had been worked on on a branch for a few weeks before. Most of the code for the shape functions is Maple-generated explicit code
- 1999/10/18: Wolfgang needs some block vectors and matrices, so adds them to the library
- 2000/4/13: First public version, deal.II 3.0, 124,000 lines of code

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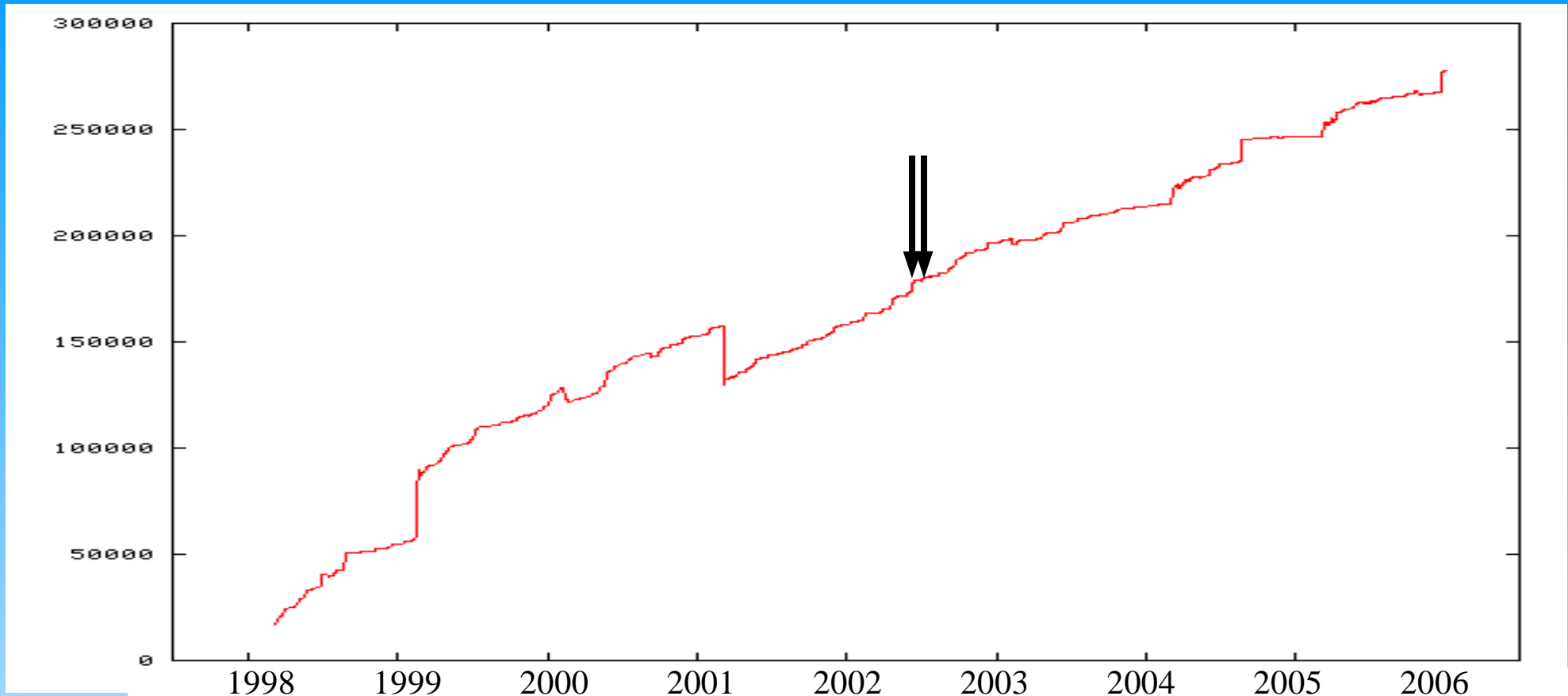
- 2001/2/20: deal.II 3.1 released, 157,000 lines of code
- 2001/3/6: Ralf replaces the old machine generated code for shape functions and their derivatives by code that uses polynomial representations. The new code is much faster, cleaner, and removes 28,000 lines of code
- 2001/5/23: First non-gcc compiler is supported after Intel releases trial copies of their ICC compiler. Compaq's CXX follows 2 months later

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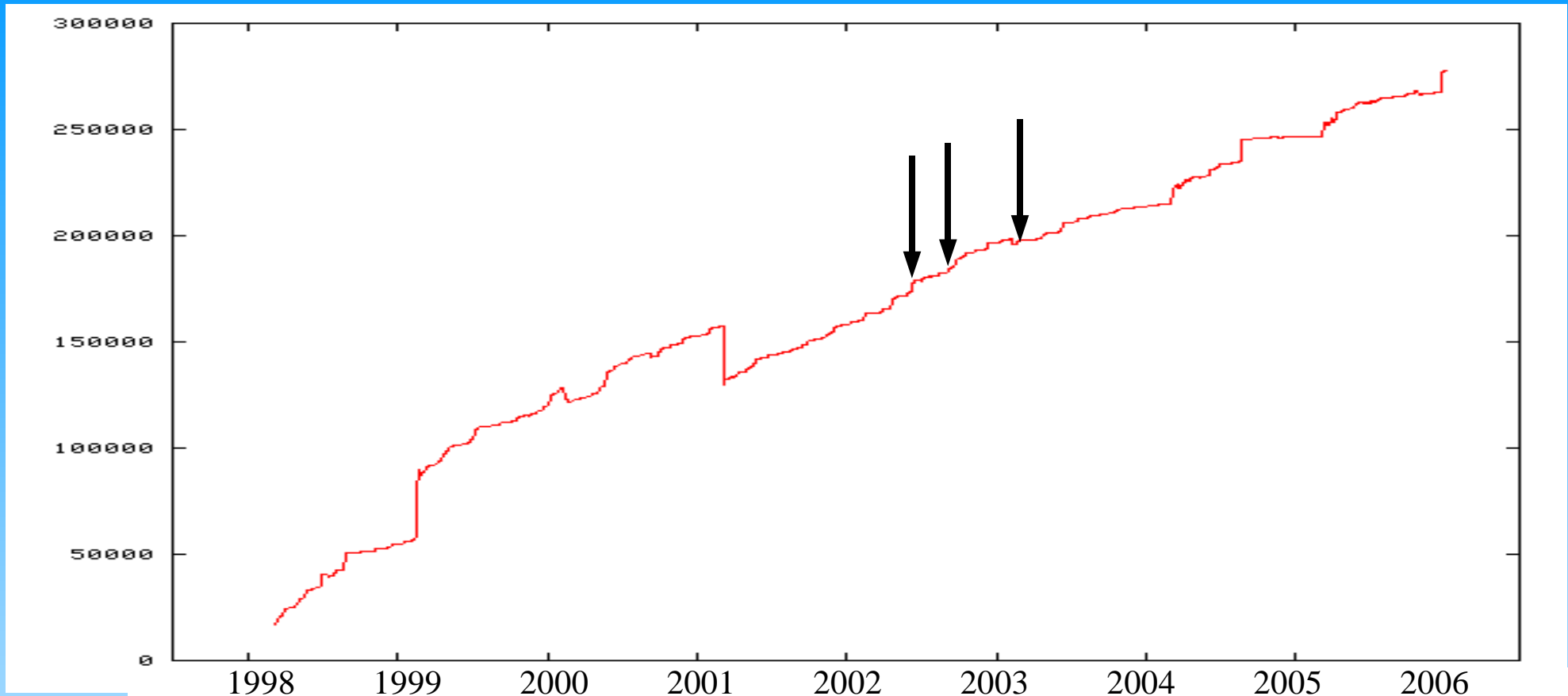
- 2001/9/28: deal.II 3.2 released, 150,000 lines of code. It contains a generalization of mappings and now supports not only Q1, but arbitrary polynomials mappings implemented by Ralf and Guido. Step-12 shows DG discretizations
- 2002/02/01: deal.II 3.3 released, 160,000 lines
- 2002/03/07: The www.dealii.org domain comes online

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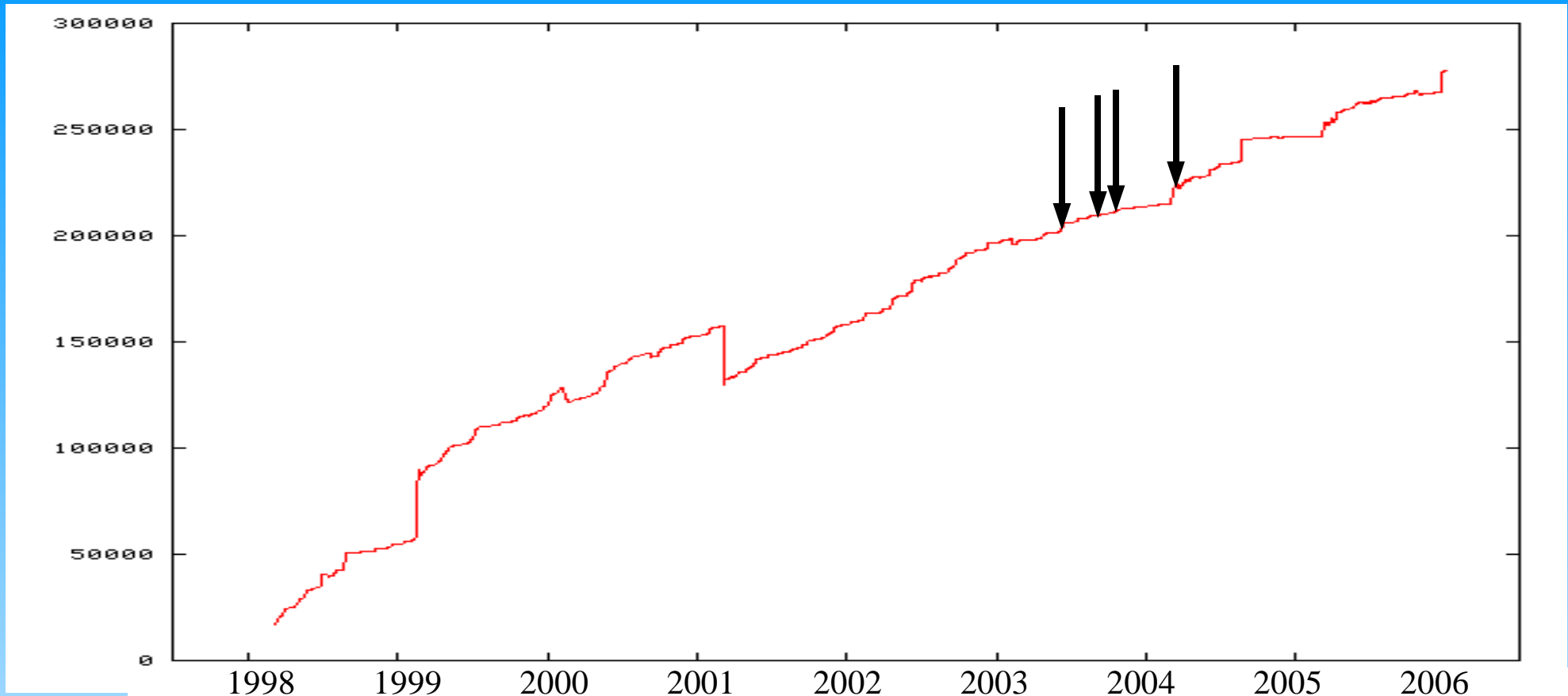
- April 2002: Wolfgang moves to Zurich, Switzerland, to support Rannacher for a guest lecturership. Step-13 and step-14 are written to show adaptive discretizations as well as error estimation techniques
- 2002/6/6: deal.II 3.4 released, 173,000 lines. New features only FE_DGP and the two example programs

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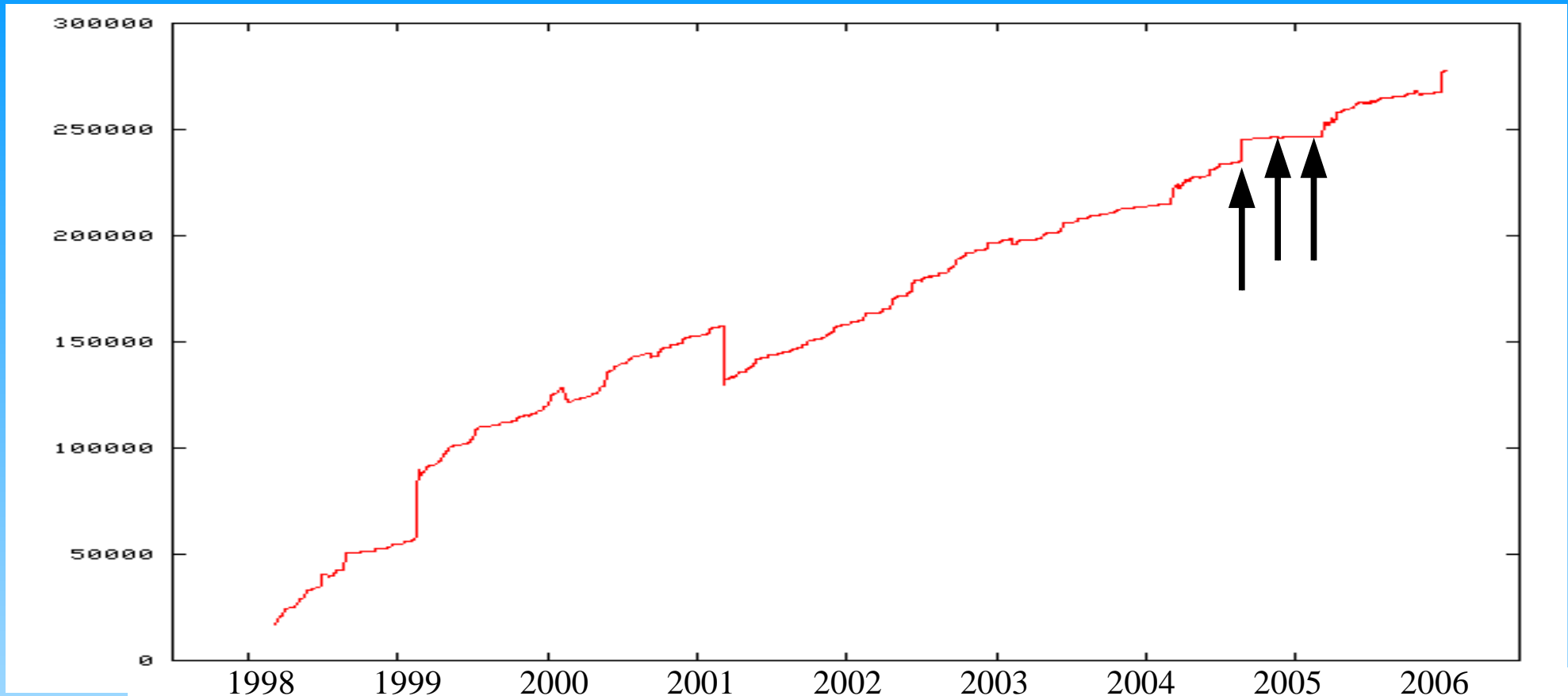
- 2002/6/10: Support for truly vector-valued elements and availability of the Nedelec element (a collaboration between Wolfgang and Anna Schneebeli of the University of Basel, Switzerland)
- August 2002: Wolfgang moves to Austin, TX, for a postdoc
- 2003/2/21: Mike Anderson implements an algorithm that allows us to read and reorder the cells of complicated 2d meshes. The algorithm now has linear instead of exponential complexity.

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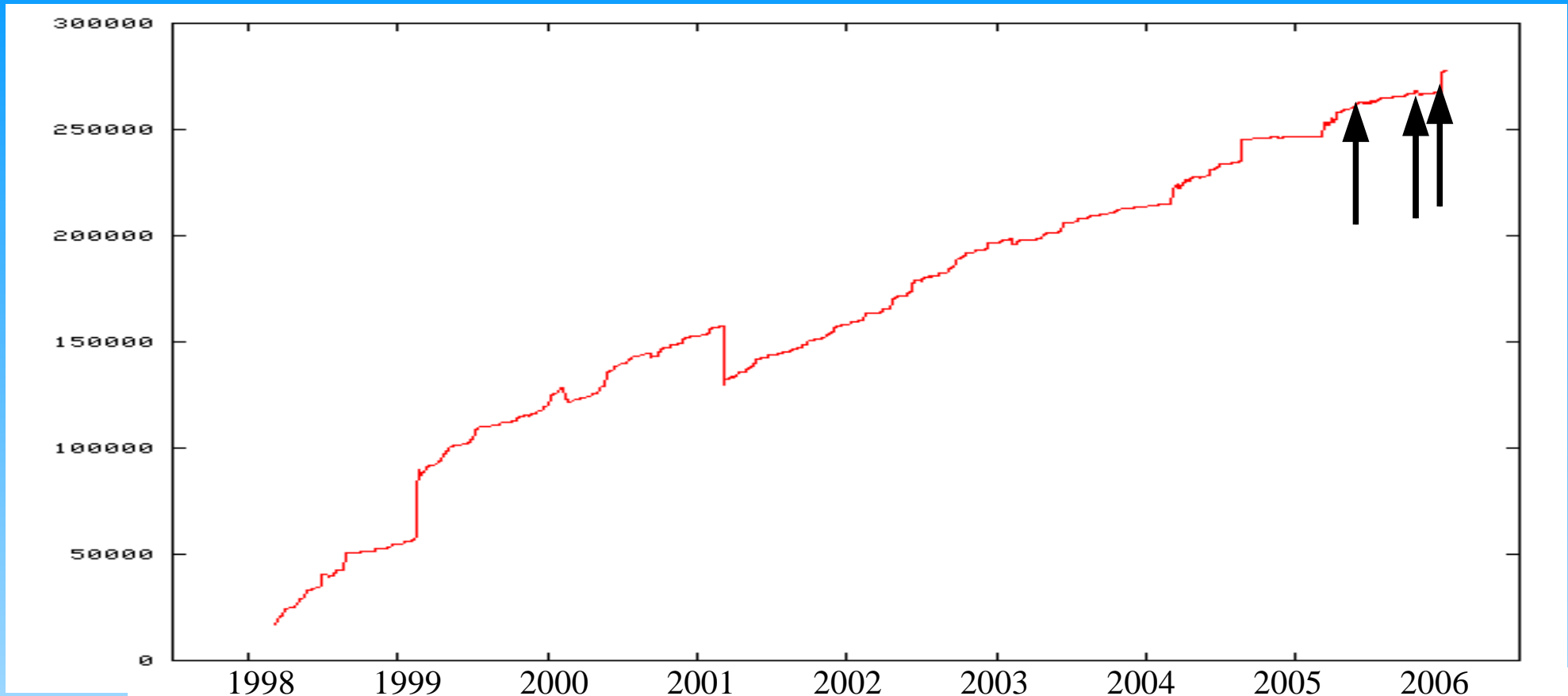
- 2003/4/27: deal.II exceeds 200,000 lines of code
- 2003/6/6: Exactly one year after version 3.4, deal.II 4.0 is released
- 2003/6/9: Raviart-Thomas elements are merged
- late 2003/early 2004: Wolfgang needs to do computations in parallel, so writes interfaces to PETSc and METIS. Step-17 shows such computations

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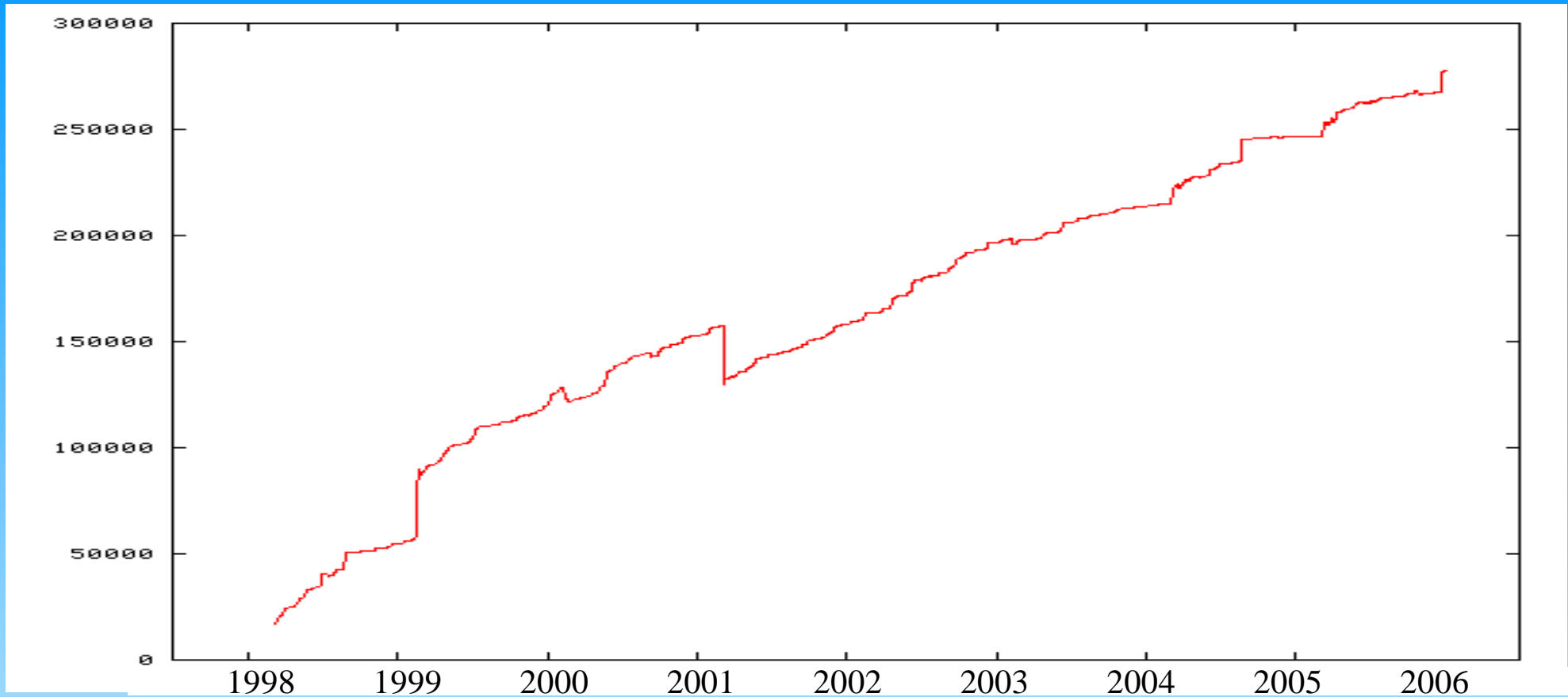
- 2004/8/21: Addition of the sparse direct solver UMFPACK
- 2004/10/21: Oliver Kayser-Herold implements code that allows to use hanging nodes in 3d for all Qp elements, not only for p=1,2
- 2004/12/24: Wolfgang applies for positions, so needs some publicity. The others agree to a new release, deal.II 5.1, now at 247,000 lines of code

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- Summer 2005: Two more tutorial programs, step-18 and 19 are developed, showing quasi-static elasticity and some parallel data handling stuff
- 2005/9/17: deal.II 5.2 is released
- 2005/12/20: Oliver Kayser-Herold merges the hp branch that he and Wolfgang had worked on since early 2003

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Today:

- deal.II has 277,418 lines of code
- some 100 downloads per month
- about 80 people on the mailing list
- about 15 people have contributed code directly
- active development of the hp functionality
- has its first User Meeting!