

DRWA10

Dolomites Research Week on Approximation 2010

Alba di Canazei (Trento, Italy), September 6–9 2010

Working group: Exponential integrators

Organizers: Alexander Ostermann (Innsbruck) and Marco Caliari (Verona)

Exponential integrators form a well-established class of numerical methods for the time integration of stiff differential equations, such as parabolic initial-boundary value problems. In contrast to standard numerical schemes like implicit Runge–Kutta methods, they make use of exponential (and related) functions of a large matrix (the Jacobian matrix of the system). More precisely, they require the action of these matrix functions on a given vector.

In this working group we will start with a brief introduction to the theory and implementation of exponential integrators. A larger part of the tutorials will be used to discuss a meshfree implementation for the solution of parabolic PDEs. The spatial discretization will be made with radial basis functions. Moreover, the efficient computation of the above mentioned matrix functions will be addressed.

In addition to the planned tutorials, we offer the participants the possibility to present their own research results on the basis of contributed talks, of about 30 minutes, and posters.

scheduling

| | Monday 6 | Tuesday 7 | Wednesday 8 | Thursday 9 |
|-------------|-------------------------|--------------------------------|-------------|--------------------------|
| 9.30–11.00 | | tutorial | tutorial | tutorial |
| 11.00–11.30 | | coffee break | excursion | coffee break |
| 11.30–13.00 | registration | exponential integrators | | matrix functions |
| 13.00–15.00 | lunch | lunch | | lunch |
| 15.00–16.30 | tutorial | plenary talk | | poster session |
| 16.30–17.00 | coffee break | coffee break | | coffee break |
| 17.00–18.30 | general concepts | contributed talks | | contributed talks |
| | | 21.00 wine tasting | | 20.00 social dinner |