ROMSOC

8th Supervisory Board Meeting

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Reduced Order Modelling, Simulation and Optimization of Coupled Systems (ROMSOC)

March 25, 2021 (Online)

Funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie Grant Agreement No. 765374.

Agenda

1. Organization & Management
2. Discussion of upcoming Deliverables
3. Further Points

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Current state of the project -Amendment to GA

- The 2nd Amendment to the Grant Agreement is in force since Dec 1, 2020.
- It includes the following changes:
  - early termination of ESR4's project and rescheduling of deliverables (Annex 1)
  - extension of project duration by 12 months (**new project end is 31/08/2022**)
  - reporting periods (Art. 20.2 GA): M1 to M24, and M25 to M60
  - decrease in the estimated budget (Annex 2) due to reduction of person-months (0.14 PM for FVB-WIAS and 17.2 person-months for U-HB)
  - maximum grant amount/estimated eligible costs (Art. 5.1 & 5.2 GA) changed to EUR 2.661.418,08 (EUR 120.502,05 less than before)

To Do

- Researcher Declaration needs to be updated in the Participant Portal (this concerns ESR5, ESR6, ESR7, and ESR11).

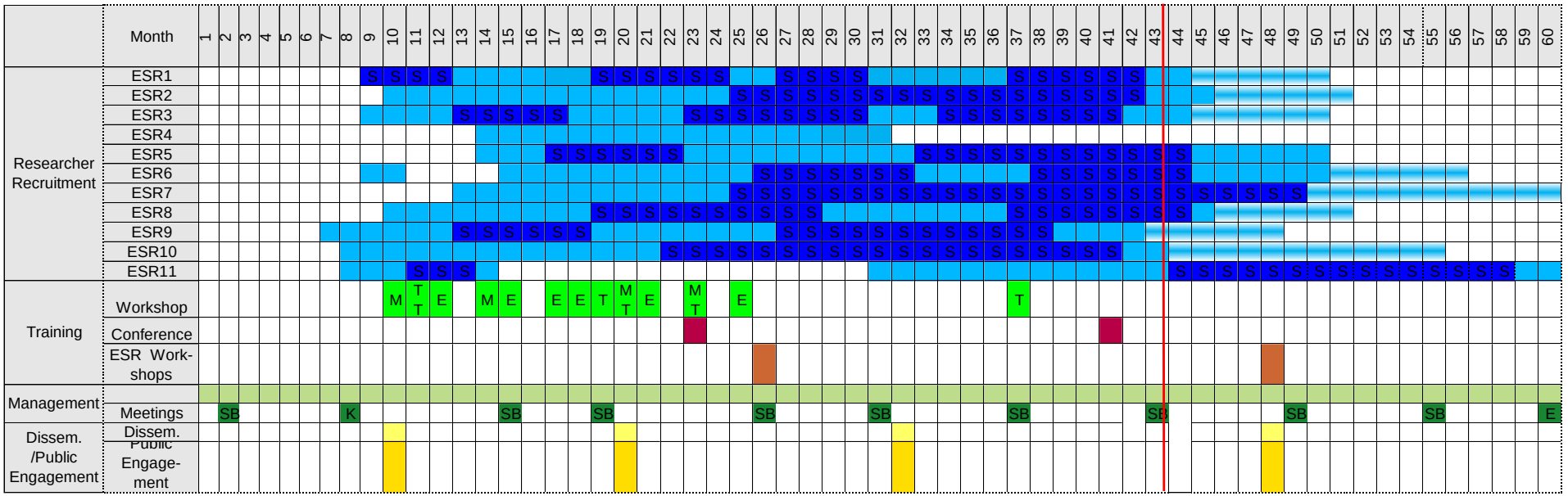
Extension of ESR's contracts

	Name of fellow	Old End Date	New End Date	'inofficial' months
ESR1	Bernadett Stadler	30-04-2021	31-10-2021	6 months
ESR2	Ashwin Nayak	24-06-2021	31-12-2021	6 months
ESR3	Giorgi Rukhaia	30-04-2021	31-10-2021	6 months
ESR5	Marcus Bannenberg	31-08-2021	18-10-2021	(tbd)
ESR6	Onkar Jadhav	31-08-2021	30-04-2022	6 months
ESR7	Jonasz Staszek	31-08-2021	31-08-2022	12 months
ESR8	Umberto Morelli	17-06-2021	31-12-2021	6 months
ESR9	Marco Martinolli	28-02-2021	31-08-2021	6 months
ESR10	Nirav Shah	15-04-2021	15-04-2022	12 months
ESR11	Hong Nguyen	31-08-2021	31-08-2022	–

'Inofficial' refers to the use of left-over budget from cost category B or other financial sources.

Note: No secondment requirements for 'inofficial' extension of working contracts!

Project timeline (update March 2021)



Expected Total Budget (March 2021)

			A. Costs for recruited researchers				B. Institutional Costs			**Total costs**
	No. of Units	Family charges (Units)	A.1. Living allowance	A.2. Mobility allowance (600,- p. unit)	A.3. Family allowance (500,- p. unit)	Sum A.1.+A.2.+A.3.	B.1. Research, training and networking costs (1800,- p. unit)	B.2.a. Local Management and indirect costs (55%)	B.2.b. Central management costs (45%)	
1. MATHEON-TUB	18	0	55.308,24	10.800,00	0,00	66.108,24	32.400,00	11.880,00	204.476,40	**314.864,64**
2. MathConsult	19,47	0	63.458,18	11.682,00	0,00	75.140,18	35.046,00	12.850,20	0,00	**123.036,38**
3. JKU	18	0	58.667,04	10.800,00	0,00	69.467,04	32.400,00	11.880,00	0,00	**113.747,04**
4. Microgate	18	0	59.730,66	10.800,00	0,00	70.530,66	32.400,00	11.880,00	0,00	**114.810,66**
5. ITMATI	72	36	218.545,92	43.200,00	18.000,00	279.745,92	129.600,00	47.520,00	0,00	**456.865,92**
6. INRIA	36	0	124.275,60	21.600,00	0,00	145.875,60	64.800,00	23.760,00	0,00	**234.435,60**
7. U-HB	17,33	0	53.249,54	10.398,00	0,00	63.647,54	31.194,00	11.437,80	0,00	**106.279,34**
8. BUW	36	0	110.616,48	21.600,00	0,00	132.216,48	64.800,00	23.760,00	0,00	**220.776,48**
9. FAU	36	36	110.616,48	21.600,00	18.000,00	150.216,48	64.800,00	23.760,00	0,00	**238.776,48**
10. Mox-PoliMi	36	0	119.461,32	21.600,00	0,00	141.061,32	64.800,00	23.760,00	0,00	**229.621,32**
11. SISSA	36	0	119.461,32	21.600,00	0,00	141.061,32	64.800,00	23.760,00	0,00	**229.621,32**
12. FVB-WIAS	35,86	0	110.186,30	21.516,00	0,00	131.702,30	64.548,00	23.667,60	0,00	**219.917,90**
Total consortium	**378,66**		**1.203.577,09**	**227.196,00**	**36.000,00**	**1.466.773,09**	**681.588,00**	**249.915,60**	**204.476,40**	**2.602.753,09**

Finances

Forwarding of budget to beneficiaries:

- The Coordinator has received 2.364.447,85 EUR in total from the European Commission (Prepayment + Interim Payment), $\sim$ 91% of the expected total budget.
- $\sim$ 90% of the pro rata amounts of total costs has been issued to the beneficiaries.
- Final balancing will take place after the last financial report (after project months 60).

Central Management Costs (45% of B.2 according to CA):

- 204.476,40 EUR to cover the costs of management activities: mainly used for ethical monitoring (38T EUR), the costs of project manager (PM) (salary plus travel) and dissemination activities.
- Current estimate: amount remaining $\sim$ 35T EUR (incl. 8T EUR buffer for dissemin.)
- Cost for PM for one year $\sim$ 33T (with the currently agreed working hours)
- This leave room for prolongation of PM contract for 12 months (until the end of project). $\hookrightarrow$ **Ask for approval from the consortium.**

Deliverables completed

	Deliverable Title	Submitted
D1.1	Personal career development plans for all ESRs	Jul 18
D1.2	Completed training programme on Mathematical Methodologies	Sep 19
D1.3	All the ESRs pass their first-year Ph.D. evaluation at their respective institutions	Dec 19
D2.1	Report on common coupling framework, error and complexity measures	Jan 20
D2.2	Reports on specific model hierarchies for different coupling applications and error analyses	Jan 20
D3.1	Reports about new MOR techniques, error estimators and algorithms	Sep 19
D3.2	Reports on specific reduced order modelling techniques for different applications	Sep 19
D3.3	Reports and Software for new model reduction techniques in different industrial applications and the incorporation of reduced order models in model hierarchies	Jan 21
D4.1	Reports about error estimators and data-driven adaptations for modelling and optimization	Feb 20
D5.1	Reports about 8 selected benchmark cases of model hierarchies	Sep 18
D5.2	Software-based representation of selected benchmark hierarchies	Oct 19
D6.1	ROMSOC website	Aug 18
D6.2	Invited session proposals at Conference	Sep 19
D7.1	Organization of Kick-off and project meetings	Nov 17
D7.2	Consortium agreement	Mar 18
D7.3	Supervisory Board of ROMSOC	Nov 17
D7.4	Discussion platform	Sep 18
D7.5	ESR recruitment final summary report	Aug 18
D7.6	Progress Report	Sep 18
D8.1	NEC - Requirement No. 1 (Ethics)	Aug 18
D8.2	DU - Requirement No. 2 (Ethics)	Aug 18
D8.3	M - Requirement No. 3 (Ethics)	Aug 18
D9.1	Data Management Plan	Feb 18

Deliverable D3.3

- D3.3: Reports and Software for new model reduction techniques in different industrial applications and the incorporation of reduced order models in model hierarchies
- Lead: **G. Rozza (SISSA)**, due date: **Oct 31, 2020**.
- D3.3 has been submitted on **Jan 15, 2021**.
- The report contains contributions from the projects of ESR1, ESR6, ESR8 and ESR10 with application in
  - atmospheric tomography,
  - thermomechanical problems,
  - inverse problems,
  - analysis of financial risk.

Milestones reached

	Milestone Title	Due	Achieved	Status
MS1	Consortium agreement signed	01.11.17	15.03.18	✓
MS2	Recruitment ESRs completed	01.09.18	19.10.18	✓
MS3	Personal career development plan ESRs	01.05.18	14.11.18	✓
MS4	Project website online	01.07.18	04.07.18	✓
MS5	Selected benchmarks of model hierarchies available	01.09.18	30.09.18	✓
MS6	ESRs pass 1st-year Ph.D. evaluation	01.03.19	19.12.19	✓
MS7	Specific model hierarchies for diff. coupl. appl. available	01.04.19	13.01.20	✓
MS8	Software-based representation of selected benchmark hierarchies equipped with publically available data ready	01.05.19	30.09.19	✓
MS9	Specific ROM techniques for diff. appl. available	01.07.19	15.07.19	✓
MS12	Software for incorporation of reduced order models in model hierarchies available	30.11.20	12.01.21	✓
MS16	All recruited fellows enrolled in PhD programme	01.09.18	29.11.18	✓
MS17	Project check (meeting between REA & consortium)	01.11.18	27.11.18	✓

Dissemination and Communication Activities

- Blog:
  - Currently 23 contributions have been published (www.romsoc.eu/blog/)
  - Further contributions, beside the regularly scheduled, are always welcome!

- Social Media:
  - Twitter profile: currently 98 Followers (1.5K impressions in March 2021 so far).
  - Facebook page: currently 63 subscribers and 58 Page Likes.
  - LinkedIn page: currently 29 followers.

- 2020 ECMI Annual Report:
  - includes a report on ROMSOC with first results from some of the ESR's projects.

- 14th WCCM & ECCOMAS 2020 January 11-15, 2021 (online)
  - MS "Coupled multiphysics problems and reduced order methods applied to compute digital twin models in industrial applications" organized by A. Prieto, G. Rozza & P. Maass with presentations by M. Bannenberg, A. Nayak, and B. Stadler.

Online Seminar Series

- **Organizers:** Jonasz Staszek (FAU) and Giorgi Rukhaia (INRIA)
- Monday at 2:00 pm every two weeks
- 9 talks have been given since October, the last talk given by Hong Nguyen is scheduled for April 12, 2021 (previously April 5th)
- Average number of participants: ~ 12
- **Benefit:** exchange and discussions between the fellows and the subprojects, foster cooperation, regular meetings strengthens group cohesion.

- Shall we continue with the seminar series?
- Shift or extend focus (e.g. include topics that can help to develop soft-skills)?
- Other (better) time slot?

ROMSOC Project Results

- Results of the project can be promoted on the new *Horizon Results Platform*:
  https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/horizon-results-platform

- In H2020, a result is defined as: *"Any tangible or intangible output of the action, such as data, knowledge and information whatever their form or nature, whether or not they can be protected, which are generated in the action as well as any attached rights, including intellectual property rights".*

- A **Key Exploitable Result (KER)** is an identified main interesting result which has been selected and prioritised due to its high potential to be "exploited" – meaning to make use and derive benefits- downstream the value chain of a product, process or solution, or act as an important input to policy, further research or education.

- KERs should be selected according to (1) degree of innovation (2) exploitability & (3) impact.

ToDo

- Send any result that can be promoted as KER to Lena Scholz.

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Upcoming Deliverables

	Deliverable Title	Lead
D2.3	Reports and Software for parameterized coupling interface	BUW
D4.2	Reports about new techniques for the integration of model hierarchies into optimization techniques	FAU
D4.3	Reports and Software for new optimization methods in different industrial applications	FAU
D5.3	Benchmark cases	ITMATI
D6.3	Final workshop on future valorisation of the results and industrial knowledge transfer	JKU

Upcoming Deliverables

- **WP2: Coupling Methods** (Lead: **BUW**, involved ESRs: 2, 5, 8, 9)
  - D2.3: Reports and Software for parameterized coupling interface (due: **Jan 2021**, dissemination level: confidential)
  - Status: **in progress**.
- **WP4: Optimization Methods** (Lead: **FAU**, involved ESRs: 1, 3, (4), 7, 11)
  - D4.3: Reports and Software for new optimization methods in different industrial applications (due: **Apr 2021**, dissemination level: confidential)
  - D4.2: Reports about new techniques for the integration of model hierarchies into optimization techniques (due: **Apr 2021**, dissemination: public)

Benchmark Collection

- **WP5: Benchmarks for Model Hierarchies** (Lead: **ITMATI**, ESRs: all)
- D5.3: Benchmark cases (due: **June 2021**, dissemination level: public)
  - D5.3 should looks like a software release including a brief documentation.
  - A Template and instructions will be provided by ITMATI.
  - Selected Benchmarks can be published separately (e.g. as Technical Reports) to exploit the results as far as possible.

WP6: Dissemination

- **WP6: Dissemination** (Lead: **JKU**, ESRs: all)
  - D6.3: Final workshop on future valorisation of the results and industrial knowledge transfer (due: **Sep 2021**, dissemination level: public)

- **Suggestion:** Make this final workshop (D6.3) the 2nd Workshop in Industrial Mathematics (WIM2021) (provisionally rescheduled for April 19-23, 2021)

ToDo

- Fix a new date (August/September 2021?)
- Decide on the format of the workshop (Online/hybrid?)
- Decide on the implementation of knowledge transfer to industry ($\hookrightarrow$ budget for dissemination activities)

Industrial Knowledge Transfer (excerpts)

	Knowledge Transfer to Industry	Future valorization
ESR1	Novel AO algorithm developed at JKU was implemented on real-time hardware of Microgate; performance of the algorithm optimized for CPUs, GPUs and FPGAs	opportunity for Microgate to provide a package including hard- and software for AO
ESR2	Mathematical models have been developed for still-fluid, steel mesh and porous layer media; software has been validated against testcases; workflow has been established.	digital-twin for intelligent design and rapid prototyping of acoustic sensor housings
ESR6	MOR approach for efficient computation of financial instruments; analyzed, implemented, and tested on industrial data for different financial instruments.	Methodology may be valorized by the company.
ESR8	ROM techniques to achieve real-time performances in the computation of the heat flux between mold and steel in CC; industrial benchmarks to test performance, robustness and efficiency of the methods.	enhances data assimilation and control in continuous casting molds to increase productivity and safety.
ESR9	Alternative numerical approach to solve the FSI problem arising inside the CorWave LVAD. Also transfer of more general knowledge (programming, numerical simulations)	software for 3D simulations of FSI will be provide to the company; improve pump dynamics and design.
ESR11	Goal: FV and/or FE-based optimization tool to solve appropriate turbulence models in order to optimize the shape design of air ducts in combustion engines. Benchmark case is propose; software will be implemented, analyzed and tested for industry relevant use cases.	Possibly future valorization of the software package together with the industrial partner Math.Tec.

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Further points

- New ITN Proposal $\hookrightarrow$ Zoom meeting in April organized by Axel Kroener.

- **ECMI 2021 conference**: online April 13-15, 2021
  - Michael Günther & Markus Bannenberg members of the Organizing Commitee
  - MS "The European Industrial Doctorate ROMSOC" organized by A. Binder with contributions of M. Bannenberg, O. Jadhav, U. Morelli and N. Shah.

Next Supervisory Board Meetings

- **9th SB Meeting** in September 2021
- 10th SB meeting (tbd)