ROMSOC

7th Supervisory Board Meeting

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Technische Universität Berlin

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

September 29, 2020 (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. Discussion and Brainstorming Session for Follow-up Proposal
4. Miscellaneous

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Status of 2nd Amendment Request

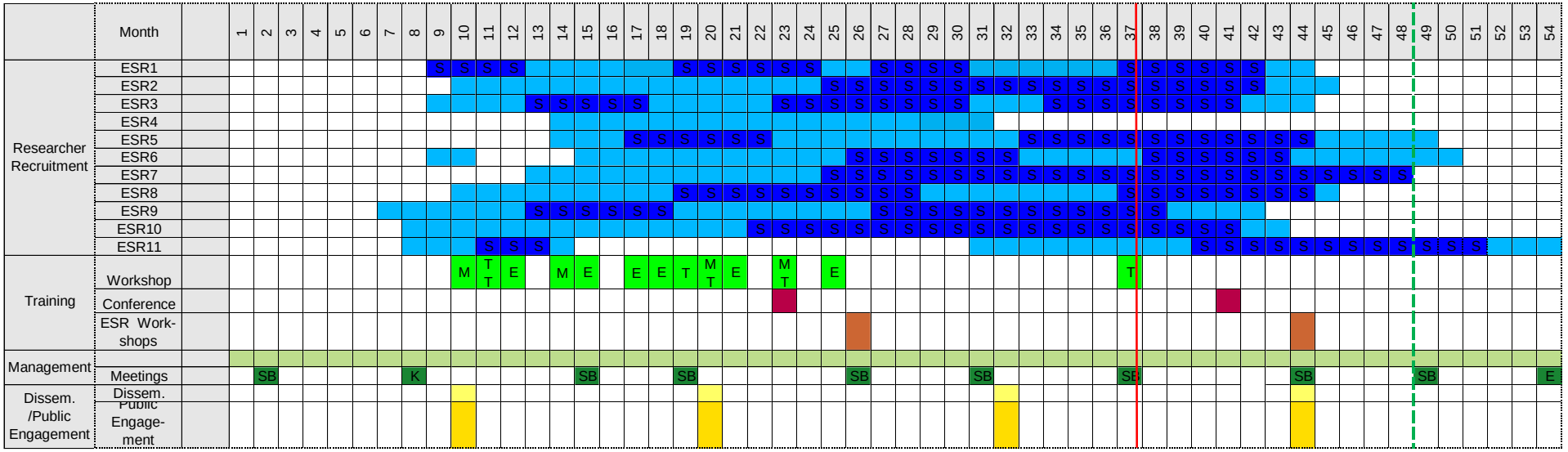
- Project Officer confirmed that ROMSOC will be granted with a 6-month extension.
- The official process needs to finalized in the participant portal.

To Do

- Decide on rescheduling of upcoming deliverables and milestones. ▸ Excel Sheet
- Check Secondment duration for the fellows whose working contract will be extended (ESR5, ESR6, ESR7, ESR11)

- Other points addressed in the Amendment:
  - termination of the project of ESR4 on March 10, 2020 (necessary exposure to the non-academic sector was not possible due to COVID-19 restrictions),
  - transfer of 1.47 person months from U-HB (from the unused person-months of ESR4) to MathConsult,
  - reduction of the budget for U-HB by 17,2 person months,
  - reduction of the budget for WIAS by 6.15 person months,
  - transfer of 3 person months from STM to BUW (STM stays beneficiary).

Project timeline (update September 2020)



Finances

- Payment of last installment of Prepayment (25%) and second half of Interim Payment (50%) has been issued to the beneficiaries
- FAU: to balance the amount for the family allowance in addition a payment of 9.000,- EUR as been issued.
- Instruction of payment as of September 28, 2020.

Expected Total Budget (after Amendment)

		A. Costs for recruited researchers				B. Institutional Costs			Total costs
	No. of Units	A.1. Living allowance	A.2. Mobility allowance (600,- p. unit)	A.3. Family allowance (250,- 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	55.308,24	10.800,00	4.500,00	70.608,24	32.400,00	11.880,00	201.236,40	**316.124,64**
2. MathConsult	19,47	63.458,18	11.682,00	4.867,50	80.007,68	35.046,00	12.850,20	0,00	**127.903,88**
3. JKU	18	58.667,04	10.800,00	4.500,00	73.967,04	32.400,00	11.880,00	0,00	**118.247,04**
4. Microgate	18	59.730,66	10.800,00	4.500,00	75.030,66	32.400,00	11.880,00	0,00	**119.310,66**
5. ITMATI	72	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	124.275,60	21.600,00	9.000,00	154.875,60	64.800,00	23.760,00	0,00	**243.435,60**
7. U-HB	17,33	53.249,54	10.398,00	4.332,50	67.980,04	31.194,00	11.437,80	0,00	**110.611,84**
8. BUW	36	110.616,48	21.600,00	9.000,00	141.216,48	64.800,00	23.760,00	0,00	**229.776,48**
9. FAU	36	110.616,48	21.600,00	9.000,00	141.216,48	64.800,00	23.760,00	0,00	**229.776,48**
10. Mox-PoliMi	36	119.461,32	21.600,00	9.000,00	150.061,32	64.800,00	23.760,00	0,00	**238.621,32**
11. SISSA	36	119.461,32	21.600,00	9.000,00	150.061,32	64.800,00	23.760,00	0,00	**238.621,32**
12. FVB-WIAS	29,86	91.750,22	17.916,00	7.465,00	117.131,22	53.748,00	19.707,60	0,00	**190.586,82**
Total consortium	**372,66**	**1.185.141,01**	**223.596,00**	**93.165,00**	**1.501.902,01**	**670.788,00**	**245.955,60**	**201.236,40**	**2.619.882,01**

Expected Total Budget (after Amendment)

			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	201.236,40	**311.624,64**
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	29,86	0	91.750,22	17.916,00	0,00	109.666,22	53.748,00	19.707,60	0,00	**183.121,82**
Total consortium	**372,66**		**1.185.141,01**	**223.596,00**	**36.000,00**	**1.444.737,01**	**670.788,00**	**245.955,60**	**201.236,40**	**2.562.717,01**

Evaluation – Career Development – Partnership Agreements

- **Career Development Plans** for the final year of the PhDs are required:
  - 1 done, 6 still missing, 3 fellows are not yet in the final year of their PhD
- **2nd Year Evaluation of ESRs** is required:
  - 1 done, 6 still missing, 3 have not yet completed their 2nd year
- **Partnership Agreement**:
  - 7 signed PAs are finalized, 3 still in preparation

To Do

- Finalize the pending PAs.
- After the fellow has finished his/her 2nd year
  - evaluate the fellow using the provided template,
  - prepare the CDP for the final year of the fellow,
  - send copies of the signed evaluation and of the CDP to L. Scholz.

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	✓
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	✓

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
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

No deliverables submitted since the last SB meeting in March 2020.

Dissemination and Communication Activities

- Blog:
  - Currently 18 contributions have been published (www.romsoc.eu/blog/)
  - Further contributions, beside the regularly scheduled, are always welcome!

- Social Media:
  - Twitter profile: currently 80 Followers (1.3K impressions in August 2020).
  - Facebook page: currently 57 subscribers and 54 Page Likes.
  - LinkedIn page: currently 17 followers.

Webpage:

- The "Publication" subsection (now "Dissemination Activities") has been updated (https://www.romsoc.eu/dissemination/)
  - entries are linked to the files stashed on the Zenodo repository,
  - PaperHive widgets will be included.

Proceedings/Preprints (coauthored by ESRs)

Proceedings:

1. M. Martinolli, B. Stadler, N. Auer, U. E. Morelli et al.: *Order Reduction on Dynamic Systems using Machine Learning*. Proceedings of 139ESGI, Santiago de Compostela, 9-13th July 2018.
2. E. M. Ortega, A. S. Nayak, F. Varas: *Simplified Modeling of Brazing Furnaces*. Proceedings of 139ESGI, Santiago de Compostela, 9-13th July, 2018.
3. B. Stadler, R. Biasi, M. Manetti, R. Ramlau: *Feasibility of standard and novel solvers in atmospheric tomography for the ELT*. Proceedings of AO4ELT6, Québec City, June 9-14, 2019.

Preprints:

1. M. Bannenberg, A. Ciccazzo, M. Günther: *Coupling of Model Order Reduction and Multirate Techniques for Coupled Dynamical Systems*, Preprint BUW-IMACM 20/22, 2020.
2. M. Martinolli, J. Biasetti, S. Zonca, L. Polverelli, C. Vergara: *Extended Finite Element Method for Fluid-Structure Interaction in Wave Membrane Blood Pumps*. MOX-Report No. 39/202, 2020.
3. A. Binder, O. Jadhav, V. Mehrmann: *Model order reduction for parametric high dimensional models in the analysis of financial risk*, arXiv Preprint 2020.
4. J.-D. Benamou, W. L. Ijzerman, G. Rukhaia: *An Entropic Optimal Transport Numerical Approach to the Reflector Problem*, Preprint 2020, hal-02539799.
5. B. Stadler, R. Biasi, M. Manetti, R. Ramlau: *Real-time implementation of an iterative solver for atmospheric tomography*, arXiv Preprint 2020.

Online Seminar Series

- An online seminar series will be organized to train the fellows in giving scientific presentations, keep the connection between the subprojects & networking.
- **Organizers:** Jonasz Staszek (FAU) and Giorgi Rukhaia (INRIA)
- 1 hour every two weeks (45 minutes for presentation + 15 minutes for Q&A)
- Start in mid-October (all fellows can present their work until March 2021).
- Next steps: schedule a recurrent time slot (Doodle to fill out until 30 Sep 2020)

- **Some ideas (to be discussed):**
  - open for external participants (e.g. from the local working groups), initially as listeners later also as speaker (if of interest),
  - Email distribution list with everyone interested for announcements

Horizon Results Booster services

- Project funded under H2020 can apply to Horizon Results Booster services (free of charge).
- Support to disseminate effectively and/or boost its exploitation potential including three services:
  1. Portfolio Dissemination & Exploitation Strategy (divided into 3 modules that can be combined):
     - Module A: identifying and creating the portfolio of R&I project results
     - Module B: helping projects from the portfolio to design and execute a portfolio dissemination plan.
     - Module C: assisting projects to improve their existing exploitation strategy.
  2. Business Plan Development
  3. Go-to-Market Support
- Booster services are available from July 2020 to June 2024.

3rd Workshop on Ethics

- The 3rd Workshop on Ethics took place on **September 15, 2020**.
- 20 participants attended the webinar.
- A ROMSOC MoodleCloud has been created (https://romsoc.moodlecloud.com)
- All documents related to the three workshops and the reports can be found on this cloud.
- A discussion forum is included for any ethic-related questions that may come up in the future.

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Upcoming Deliverables

	Deliverable Title	Lead
D2.3	Reports and Software for parameterized coupling interface	BUW
D3.3	Reports and Software for new model reduction techniques in different industrial applications and the incorporation of reduced order models in model hierarchies	SISSA
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

Related Milestones

	Milestone Title	Lead
MS10	New optimization methods in different industrial applications available	FAU
MS11	Software for parameterized coupling interface available	BUW
MS12	Software for incorporation of reduced order models in model hierarchies available	SISSA
MS13	Benchmark cases	ITMATI
MS14	Ph.D. degrees ESRs awarded	MOX
MS15	Benchmarks for model hierarchies available for the use in training courses	ITMATI

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)

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)

- **WP3: Reduction Methods** (Lead: **SISSA**, involved ESRs: 1, 6, 8, 10)
  - D3.3: Reports and Software for new model reduction techniques in different industrial applications and the incorporation of reduced order models in model hierarchies (due: **Sep 2020**, dissemination level: confidential)

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)

- **WP3: Reduction Methods** (Lead: **SISSA**, involved ESRs: 1, 6, 8, 10)
  - D3.3: Reports and Software for new model reduction techniques in different industrial applications and the incorporation of reduced order models in model hierarchies (due: **Sep 2020**, dissemination level: confidential)

- **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: **Oct 2020**, dissemination level: confidential)
  - D4.2: Reports about new techniques for the integration of model hierarchies into optimization techniques (due: **Nov 2020**, dissemination: public)

Benchmark Collection

- **WP5: Benchmarks for Model Hierarchies** (Lead: **ITMATI**, ESRs: all)

- D5.1 and D5.2 have been updated:
  - D5.1: Reports about 8 selected benchmark cases of model hierarchies, Version 3.0, June 2020 (`https://doi.org/10.5281/zenodo.3888124`)
  - D5.2:Software-based representation of selected benchmark hierarchies equipped with publically available data, Version 2.0, June 2020 (`https://doi.org/10.5281/zenodo.3888145`)

- D5.3: Benchmark cases (due: **Jan 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)
- **Objectives:** Increase synergies between academia and industry in the field of MSO; initiate the transfer of results to the scientific community and to real-world (industrial) applications.
- **Task 6.1:** Set up ROMSOC website ✓, organization of workshops ✓, invited sessions at conferences ✓ and publications (in progress).
- **Task 6.2:** Knowledge transfer to industry using industrial partner as pivotal points to translate cutting-edge research into software directly applicable to real-world industrial challenges.
  - D6.3: Final workshop on future valorisation of the results and industrial knowledge transfer (due: **Feb 2021**, dissemination level: public)
- **To discuss: How do we implement D6.3?**

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Funding under Horizon Europe

- The new EU research & innovation investment programme (2021 –2027)
- No Calls available yet (European Research and Innovation Days on 22-24 Sep 2020), **but**
- Pillar 1 ("Excellent Science") will include Marie Skłodowska-Curie Actions (e.g. ITNs)
  - equipping researches with new knowledge and skills through mobility and training
  - Commission proposal: 6.8 billion EUR ($\sim$ 8% of overall budget for Horizon Europe)
  - For comparison: MSCA budget under Horizon 2020 (2014-2020): 6.2 billion EUR ($\sim$ 8% of the overall H2020 budget).

Follow-up application of ROMSOC

Points to discuss:

- Who could take the role of coordinator?
- Possible topics for future proposal (cross-cutting issues)?
- Who wants to participate?
- Stick to our matrix of mathematical methodologies: Reduced Order Methods (R), Coupling Methods (C), Optimization Methods (O) vs. Industrial Applications but with a new thematic focus?
- ...

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WCCM-ECCOMAS

- 14th World Congress on Computational Mechanics (WCCM XIV) 8th European Congress on Computational Methods in Applied Science and Engineering (ECCOMAS 2020) will take place as a virtual congress on January 11-15, 2021.
- Minisymposium MS458: "Coupled multiphysics problems and reduced order methods applied to compute digital twin models in industrial applications" has been organized by A. Prieto, G. Rozza and P. Maass.
- 11 contributions have been submitted including contributions by
  - M. Bannenberg (ESR5), M. Günther and A. Ciccazzo
  - A. S. Nayak (ESR2), A. Prieto and D. Fernández-Comesaña,
  - R. Biasi, R. Ramlau and B. Stadler (ESR1)
  - D. Otero Baguer, S. Dittmer and P. Maaß

2nd ESR-Workshop (WIM2021)

- The **2nd Workshop in Industrial Mathematics (WIM2021)** has been rescheduled for the week **April 19-23, 2021** to be held in Catania, Italy.
- Organization Committee:
  - Marcus Bannenberg (BUW)
  - Giuliana Gangemi (STM)
  - Michael Günther (BUW)
  - Onkar Jadhav (MathConsult/TUB)
  - Umberto Morelli (ITMATI)
  - Gianluigi Rozza (SISSA)
- Next steps . . .

Upcoming Events

- MSCA – European Researcher's Night on November 27, 2020
- SIAM Conference on Computational Science and Engineering (CSE21), March 1-5, 2021 in Fort Worth, Texas (either as hybrid or 100% virtual conference)
- SIAM Conference on Applied Linear Algebra (LA21), May 17-21, 2021, in New Orleans, U.S.
- International Workshop on Reduced Order Methods, 17 - 21 May 2021 in Singapore (organized by Gianluigi Rozza)
- ECMI 2020 provisional rescheduled to 21–25 June, 2021
- ECCOMAS Young Investigators Conference (YIC 2021), 7-9 July 2021 in Valencia (Spain)
- ...

Next Supervisory Board Meetings

- **8th SB Meeting** initially scheduled for February 2021. Suggestion: synchronize with WIM2021 and postpone it to April 2021.
- Suggestion: schedule one more meeting in September 2021 (9th SB meeting)