

TANGO Progress Meeting 7 – Meeting Notes

Date of Meeting: 17th & 18th May 2016

Location: Seminar Room, Kerschensteiner Kolleg,
Deutsches Museum, Munich, Germany

These meeting notes are confidential to TANGO partners. The distribution list includes all those listed below (Those present / Apologies from / Other).

S Senior in network partner organisation

ER Experienced Researcher

ESR Early Stage Researcher

AA Administrative Assistant

DEP Department of Engagement and Partnerships

Those present:

Mr	Alp	Albayrak	ESR	TUM	Technische Universität München
Dr	Giovanni	Campa	S	AEN	Ansaldo Energia
Mr	Javier	Crespo Anadón	ESR	AEN	Ansaldo Energia
Mr	Nitin Babu	George	ESR	IITM	Indian Institute of Technology Madras
Prof	Maria	Heckl (Chair)	S	KU	Keele University
Dr	Jakob	Hermann	S	IfTA	IfTA Ingenieurbüro für Thermo-Akustik GmbH
Mr	Paul	Hix	S	DM	Deutsches Museum
Mr	Naseh	Hosseini	ESR	BEK	Bekaert Combustion Technology BV
Mr	Dmytro	Iurashev	ESR	AEN	Ansaldo Energia
Prof	Ines	Lopez Arteaga	S	TUE	Technische Universiteit Eindhoven
Dr	Paula	Martínez Lera	S	SISW	Siemens Industry Software
Mr	Nalini	Mukherjee	ESR	KU	Keele University
Ms	Wei	Na	ESR	KTH	Kungliga Tekniska Höskolan
Mr	Luck	Peerlings	ESR	KTH	Kungliga Tekniska Höskolan
Prof	Wolfgang	Polifke	S	TUM	Technische Universität München
Dr	Mark	Pullinger	DEP	KU	Keele University
Mr	Driek	Rouwenhorst	ESR	IfTA	IfTA Ingenieurbüro für Thermo-Akustik GmbH
Mrs	Jemma	Sharrock	AA	KU	Keele University
Ms	Lin	Strobio Chen	ESR	TUM	Technische Universität München
Prof	R.I.	Sujith	S	IITM	Indian Institute of Technology Madras
Ms	Aswathy	Surendran	ESR	KU	Keele University
Dr	Joàn	Teerling	S	BEK	Bekaert Combustion Technology BV
Mr	Muttalip	Temiz	ESR	TUE	Technische Universiteit Eindhoven
Mr	Jonathan	Tournadre	ESR	SISW	Siemens Industry Software

Apologies from:

Dr	Alessandra	Bigongiari	ER	KU	Keele University
Prof	Hans	Bodén	S	KTH	Kungliga Tekniska Höskolan
Dr	Susann	Boij	S	KTH	Kungliga Tekniska Höskolan
Prof	Alex	Bottaro	S	UG	University of Genova

Mr	Ralf	Corin	S	SON	Sontech AB
Prof	Alan	Cummings	S		
Prof	Wim	Desmet	S	KUL	Katholieke Universiteit Leuven
Prof	Gunilla	Efraimsson	S	KTH	Kungliga Tekniska Högskolan
Prof	Mico	Hirschberg	S	TUE	Technische Universiteit Eindhoven
Mr	Paul	Hix	S	DM	Deutsches Museum
Dr	Johanna	Ingenito	S	LTS	Liebherr-Aerospace Toulouse SAS
Dr	Rick	Scholte	S	SOR	Sorama

Other distribution:

Mr	James	Allman	KU	Keele University
Ms	Anne	Budgen	KU	Keele University
Ms	Kelly	Montana-Williams	KU	Keele University
Mr	Ian	Rawlinson	KU	Keele University

Note

Given names are used throughout these meeting notes; please refer to the list of those present to ascertain the role of that individual.

Presentation Material

Maria's meeting presentation slides are available to view in the 'Meeting Agendas/Minutes' page in the members' section of the TANGO website:

<http://www.scm.keele.ac.uk/Tango/tango-network-meetings>

The slides accompanying Driek Rouwenhort's presentation on patenting are also stored there, along with the slides from Dr Paula Martínez Lera on the meeting/workshop in Leuven and the presentation slides on the end-of-TANGO procedures by Dr Mark Pullinger of Keele University's Department of Engagement and Partnerships.

The TANGO Fellows' presentations can be found on the 'Fellow Presentations' page.

<http://www.scm.keele.ac.uk/Tango/tango-network-fellows-presentations>

Welcome¹

Maria opened the meeting at 13:10pm by welcoming everyone and giving a brief overview of the week's events. Dinner that evening would be financed by TANGO and Wednesday's Fellows' meal would be more informal with costs borne by the Partner Organisations.

Maria handed over to Paul, the local host and coordinator, who welcomed everyone to the Kerschensteiner Kolleg section of the Deutsches Museum, handing out registration forms for invoicing, name badges which would allow free entry to the museum, a pre-order menu for the evening meal at the *Mühlbacher in der Au* and a map of how to get there. He reminded Fellows that their meeting presentations would be videoed for analysis in the workshop.

Report by the coordinator on recent developments

Personnel Changes²

Maria explained the personnel developments since the 6th Progress Meeting:

- Prabodh Ranjan had left IITM and the vacancy created had been advertised as a short-term Experienced Research position. However, Sujith reported that there had been no suitable applicants at all.
- Alessandra had gained a 1 year Fellowship at the University of Pisa, but was still collaborating with both Maria and the TANGO project. Maria stated that Fellows who have finished their time with TANGO are welcome at the meetings and workshops provided that they are still actively involved with the project.
- Sreenath, Aswathy's husband, was a visiting researcher at Keele, working on a special project on the topic of distributed time-lag models. He would be joining in with the Fellows' presentations via Skype.

Conferences³

ICSV 23 in Athens, 10-14 July 2016 – Maria has organised a special TANGO session on the theme of Thermoacoustics and Orifice Acoustics; 20 papers have been submitted, 14 of which are by TANGO Fellows. The papers will be open access and available on the publications page of the TANGO website.

Action: Maria to contact organisers to avoid the TANGO sessions being in parallel with other similar sessions.

Post-meeting note: Maria has made the necessary requests.

All TANGO Fellows are expected to attend one or the other of the following two conferences in lieu of a technical workshop this week.

TUM Symposium in Munich, 30 May-2 June 2016 – organised by Thomas Sattelmayer and Bruno Schuermans, bringing thermoacoustic industry and academia together. 3 TANGO Fellows (Aswathy, Dmytro, Driek) are presenting papers there. Sujith has been specially invited to give an Expert Talk.

¹ Presentation by Maria slide # 2

² Presentation by Maria slide # 3

³ Presentation by Maria slide # 4

22nd AIAA/CEAS Aeroacoustics Conference in Lyon, 30 May-1 June 2016 – 2 TANGO

Fellows are presenting papers.

Post-meeting note: 3 Fellows (Jonathan, Wei, Luck) are presenting in Lyon rather than 2.

Post-meeting note: 2 Fellows (Driek, Lin) are presenting papers at the *ASME Turbo Expo in Seoul, 13-17 June 2016*.

Journal Publications⁴

Maria reported that there have been three recent publications:

- Muttalip's JASA paper entitled "The influence of edge geometry on end correction coefficients in micro-perforated plates" was published in December 2015.
- Muttalip and Jonathan have contributed to a JSV paper entitled "Non-linear acoustic transfer impedance of micro-perforated plates with circular orifices" which was published in March 2016.
- Lin's paper on "Propagation and generation of acoustic and entropy waves across a moving flame front" was published in CnF in March 2016.

There has also been progress with other publications:

- Alessandra & Maria have had a paper accepted by JFM, entitled "A Green's function approach to the rapid prediction of thermoacoustic instabilities in combustors".
- Luck has recently submitted a JSV paper entitled "Theoretical study of the viscothermal effect on the propagation of fundamental and higher-order acoustic modes in rectangular ducts with uniform mean flow" which is now under review.
- Jonathan also has a JSV paper under review, entitled "Influence of vortex disruption on the nonlinear acoustic response of orifices"

Wolfgang said that he was expecting Lin to submit her ASME paper to a peer-reviewed journal following the conference in Seoul.

Maria was pleased with the increasing list of publications submitted by TANGO Fellows and encouraged all Fellows to continue to share news of their progress so that it could be announced on the website and reported to the EU.

Patents

Maria asked Driek to give a presentation on his and Jakob's experiences with filing a patent so he could bring everyone up to date and explain what is involved in a patent application.

Driek described their invention⁵, which helps with monitoring thermoacoustic stability in annular gas turbines. He explained that there is a conflict of interest between his desire to publish his PhD work and IfTA's commercial interests; patenting allows publication whilst protecting IfTA's intellectual property.

He explained⁶ that a patent consists of up to 15 hierarchical claims which describe the invention and gives exclusive right to use it for up to 20 years in return for annual fees. Licences can be granted for commercial use by others in return for a fee. However un-

⁴ Presentation by Maria slides # 5-6

⁵ Presentation by Driek slides # 3-5

⁶ Presentation by Driek slides # 6-10

licenced use of the invention is self-policed and patent owners must be vigilant and pursue infractions themselves.

Inventions can only be patented if they are new, rather than common knowledge. Patents are country specific rather than international, but most patents are filed under one of two umbrella organisations, the Patent Cooperation Treaty (PCT) and the European Patent Organization (EPO). Patent owners choose the countries where their invention needs protecting, both for use in manufacturing and also use in imported products.

Driek pointed out that patent application is expensive and time-consuming as shown in the timeline⁷. He and Jakob submitted their original idea on 15/6/2015 and have one month left to fully describe the hierarchical claims for the PCT Office. The patent will be examined and reported on, and eventually the PCT will send the patent to the various patent offices in the countries applied for.

Paul pointed out that the European and German Patent Offices are both visible from the meeting room.

Joàn argued that technically patents give the ability to prohibit others from using an invention rather than the right to use an invention.

Paul said that patenting in China has been problematical in the past as pursuing infractions is done in the country concerned which can be prohibitively expensive for small businesses.

Joàn explained that patenting is expensive and must be worthwhile to the patent owners, e.g. fees can be in the region of €20-30K from the 3rd year after filing.

TANGO Website⁸

Maria stated that there are two main pages of the TANGO website which are regularly updated:

- News and Events page: announcements of conferences and workshops
- Planned Publications page: journal and conference papers that need reviewing in terms of Intellectual Property Rights. These are sent to Keele, uploaded for viewing and a notification is sent out to the TANGO members.

Joàn thanked Maria for ensuring that planned publications were publicised by e-mail.

European Commission⁹

Maria reassured everyone that the problems following on from the Mid-term Review held on 18-19/09/2014 had now been dealt with. She explained that the report from the EU Project Officer, Conchita Perez Camaras, had included several puzzling criticisms¹⁰ which Maria had queried without success. Conchita was suddenly replaced as Project Officer by Olivier Delaunoy on 17/08/2015. Maria contacted Olivier on 07/09/2015 to ask for further clarification regarding the MTR criticisms and on 06/10/2015 he replied that he was happy with the original plan i.e. Conchita's criticisms could effectively be ignored!

Post-meeting note: The Periodic Report for the period 01/11/2014 – 31/10/2015 was submitted on 08/02/2016.

⁷ Presentation by Driek slides # 11-14

⁸ Presentation by Maria slide # 7

⁹ Presentation by Maria slide # 7

¹⁰ Detailed in the minutes of Progress Meeting 5 at TUE

Secondments - update¹¹

Maria presented the table of completed and planned secondments. The majority of secondments are complete and Secondment Reports have been received and uploaded to the website.

- Driek will be going to Ansaldo for at least two weeks starting late July, after the ICSV23 conference – the details to be finalised with Giovanni.
- Nitin has recently started a secondment at TUM which will last until the end of July, incorporating a trip to Greece for ICSV23.
- Javier had just completed another secondment at Keele.

Mark Pullinger and Jakob Herman joined the meeting at 14:05pm.

Plans for Meeting at Siemens/Leuven in Autumn 2016

It had been decided that timing the meeting to coincide with the ISMA Conference on Noise and Vibration Engineering was not possible and TANGO members had been asked for their date preferences via a Doodle Poll. Maria explained that, whilst not ideal for everyone, the date is now fixed and the 8th TANGO Progress Meeting and Workshops will be held during the week 10th-14th October 2016 in Leuven, Belgium.

Paula gave a short presentation on the plans so far. Leuven¹² is well connected to Brussels and other European cities. Siemens Industry Software is outside the city centre, but there are good bus connections between SISW and the city centre hotels. The tentative timetable¹³ runs from Tuesday 11/10/2016 to Friday 14/10/16 but the meeting may start earlier if more time is needed within the workshop programme. Hopefully the timetable will be finalised and sent out by 30/06/2016 along with practical information. Paula asked for confirmation of attendance by 01/09/2016 as she will be unable to attend in person. Michel Tournour and other colleagues will be well-placed to host the meeting and workshops in her absence.

Maria confirmed that this will be the last formal meeting of the TANGO project. Paula reiterated that the 8th workshop will be for the Fellows rather than by the Fellows as any connection with the ISMA Conference has now been dropped.

End-of-TANGO Procedures¹⁴

Certificates

Maria announced that Fellows who have completed their term of employment with TANGO are entitled to a Certificate of Participation. Fellows should contact Jemma when they are ready to receive their certificates.

¹¹ Presentation by Maria slides # 8-9

¹² Presentation by Paula slides # 1-2

¹³ Presentation by Paula slides # 3-4

¹⁴ Presentation by Maria slide # 10

Presentation by Mark Pullinger

Mark explained that as the end of TANGO approaches there are various tasks to be performed by the Coordinator, Supervisors and Fellows in the coming months. The timeline¹⁵ showed that the reporting must be completed within 60 days of the formal end of the project on 31/10/2016. After that, it can take up to 100 days for the EU to pay out the remaining 15% of the budget to Keele which will then be shared with partner organisations if appropriate.

The reporting still required includes:

- a Periodic Report¹⁶ for the final two years of the project from the Coordinator (Keele)
- Accompanying Forms C¹⁷ from each partner organisation (not associated partners) which should be sent to Keele by 30/11/2016 to allow for checking and correction. Mark asked partners to ensure that they still have the correct access to the EC Participant Portal to make submissions and that the LEAR is still in post along with the financial signatory from Period 1 (01/11/12-31/10/14). He also pointed out that figures must match the grant agreements exactly and be made within the lifetime of the project. Management costs are more thoroughly scrutinised than training payments and justification for payments can be given in the detail fields.
- Audit Certificates¹⁸ from KU, KTH and TUM
- a Final Summary Report¹⁹ which may need some partner input and will include updates on all publications in progress.
- Questionnaires²⁰ for all Scientists-in-charge regarding research, training, outcomes etc.

Mark warned that Keele shuts down for the Christmas break on 23/12/2016 so this is the effective final date for submitting to the EC.

Records must be kept for 5 years after the project end date for audit purposes.

Action: Jemma to forward attendance registers from Meetings to partners as proof of attendance.

Mark then explained that Fellows will be sent links by Keele to anonymous questionnaires²¹ to gather statistics and help shape future research programmes. They will be asked to complete a further anonymous questionnaire 2 years after their term with TANGO; this will help assess the longer-term benefits of the project. Fellows are required to stay in touch with TANGO so that a cooperative dialogue can be maintained.

Maria reminded them that publications will still need to be checked by the partner organisations for IPR even beyond the lifetime of TANGO.

Action: Maria to send links to questionnaires for those ESRs who complete their contracts.

Wolfgang voiced concerns about the current rules including the 36 month ESR term and restrictions on eligibility and mobility which hamper recruitment.

Action: Maria to coordinate some concerted input into the Supervisors' Questionnaires.

¹⁵ Presentation by Mark slide # 2

¹⁶ Presentation by Mark slides # 4-5

¹⁷ Presentation by Mark slides # 6-11

¹⁸ Presentation by Mark slide # 12

¹⁹ Presentation by Mark slides # 14-15

²⁰ Presentation by Mark slide # 16

²¹ Presentation by Mark slides # 17-19

Break for Coffee

Fellows' Presentations

Maria asked the following Fellows to give short 10 minute presentations updating everyone on their progress since the 6th Progress Meeting and their plans: Alp, Nitin, Naseh, Lin, Aswathy, Driek, Muttalip and Jonathan.

Maria was very pleased with the quality of the talks which showed good results and lots of collaboration between Fellows.

Close – end of day 1

Maria closed the meeting for the day at 18:15pm, to reconvene at 8:30am on Wednesday 18th May 2016. She looked forward to seeing everyone at the project dinner later on at *Mühlbacher in der Au*.

Fellows' Presentations (continued)

The second batch of Fellows gave their presentations: Wei, Luck, Nalini, Javier and Dmytro. Dmytro gave Alessandra's presentation on her behalf as she was unable to attend the meeting (this presentation was not filmed). Sreenath presented his work via Skype from Keele.

Paula left the meeting at 10:45am.

Maria was very pleased with the depth and breadth of the presentations given and the progress reported.

As the meeting was running about 45 minutes late, Maria suggested combining the group photograph, coffee break and group discussions into the next 45 minutes and skipping the discussion summaries.

Break for Group Photograph²², Coffee, Group Discussions

Potential Future Activities²³

Book

Maria asked Sujith to expand on his suggestion to produce a book based on the Fellows' research topics. He felt that the aeroacoustic work was already forming quite a coherent, interwoven whole, but he was less sure how to incorporate the thermoacoustic work.

²² Available in the TANGO website gallery

²³ Presentation by Maria slide # 16

Joàn felt it should be a summary of the work of TANGO.

Wolfgang thought that a dedicated journal issue was a better dissemination channel than a book. The journal issue could have two levels: an overview level with 2 review papers (one on aeroacoustics and one on thermoacoustics) plus a detailed level with several original research papers (which could be expanded versions of the ICSV23 papers). Wolfgang is ideally placed to help with this as he is the Editor-in-Chief of the International Journal of Spray and Combustion Dynamics. This quarterly journal has open-access on-line publication in advance of the paper version. There are 5-10 papers in each issue.

Maria suggested that the original research papers could be done by small teams of fellows working on closely related topics, e.g. Lin, Aswathy and Naseh could collaborate on a paper about heat exchangers in combustion systems.

Maria volunteered to act like a guest editor and spearhead the thermoacoustics review paper. Joàn volunteered to help with that. Ines volunteered for the aeroacoustics review paper.

Action: As none of the KTH supervisors were present to volunteer, Maria will have discussions with them and Ines to give them the opportunity to contribute.

Post-meeting Note: Giovanni volunteered to help with the thermoacoustics review paper.

Another Outreach Activity

Maria was of the view that the Outreach event in September 2014 was very successful, but was a very large amount of effort for Keele as well as the whole consortium. As we are reaching the end of the project and many Fellows are busy writing up their PhD theses, Maria felt that it might be better to either think of a lower-level Outreach Activity or drop the idea altogether. Even repeating the Keele Outreach event at a different partner organisation would involve considerable effort.

Joàn suggested a short video presentation of the review papers to reach a wider public. Paul said that this sort of thing needs to be professionally made, with a "story" to it, in order to have a public appeal which will cost a minimum of €2000, possibly up to €15000, especially if there is travel involved to reach the various team members. He suggested that a video could focus on the experiences of 2 or 3 ESRs, give details of TANGO's international collaboration etc. It would almost be an advert for getting involved with a Marie Curie Actions research project.

Maria suggested that costs could be reduced by producing the video when people are gathered in Leuven.

Muttalip said that he was happy to be interviewed but would need to know questions in advance. He suggested topics such as travelling, working abroad, why an ITN is useful etc.

Ines left the meeting at 12:05pm.

Giovanni said that the EC website, [EURAXESS](http://euraxess.eu), has a video library of success stories and testimonials and that this could be a good entry to it.

Paul said that focusing the video on a specific audience was important and that a more general topic, such as what it was like to work on an international research project, would have more longevity than something scientifically focussed where the information would be out of date in a few years.

Sujith thought we should promote the gender balance of the project and that women can succeed in engineering.

Wolfgang made a further suggestion to put the two review papers discussed earlier on a [Prezi Presentation](#) which is a dynamic mind-map-like way of showing an overview of the project, task summaries, collaborative articles with deeper and deeper on-line links, ultimately to personal home pages, individual papers, theses etc. This could also help advertise the special journal issue.

Naseh felt that a Prezi or similar presentation also needed to be professionally produced by a graphic designer for maximum impact.

Action: Maria to consider these suggestions and report back before the 8th Project Meeting and Workshop in Leuven.

Last Tango Meeting in Paris

Maria wondered if there was still interest in an informal final meeting in Paris, especially as the 8th Project Meeting in Leuven was now 10-14th October rather than September 2016. In order for the meeting to be fully funded by the project it would need to take place before the end of October. Alternatively if host organisations could sponsor travel, it could take place later in the year or even during early 2017. A weekend would be preferable in either case as several Fellows may have jobs by then.

Paul was concerned that the EU might object to there being two meetings within a two to three week period.

Maria said that many projects had a separate final meeting and that it could be financed by the training budget.

Mark confirmed that use of the flat-rate (training) budget can theoretically be used after 31st October if it is set aside in some way. This could open up the timeline for the meeting.

Naseh suggested holding the Paris meeting during the weekend after the Leuven meeting. A show of hands indicated that just over half those present were interested in the Paris meeting, at any time, including directly after the Leuven meeting.

Action: Maria to investigate further, with suggestions and help from others welcome.

POLKA Update²⁴

The POLKA proposal submission in January 2016 had unfortunately been rejected in early May. Maria was very disappointed with the low rating of only 81%. However the feedback from the evaluators did give her hope: the core aspects were all judged very positively, including high-quality research, well-balanced training, prior experience and gender balance. Conversely Maria felt that the weaknesses listed were relatively minor and peripheral and could easily be addressed in a resubmission of the proposal.

Mark explained that resubmission was actually treated as a new proposal: the evaluators are aware that it has been submitted before, but they do not have access to the previous feedback. The next round of submissions would be around January 2017, with a similar structure to the previous one and 10% higher budget.

²⁴ Presentation by Maria slide # 17

Paul pointed out that, if the UK voted to leave the EU following in the June Referendum, this could affect how a UK submission was viewed, funding, visas etc.
Maria said she would deal with any challenges and changes should they arise!

Close

Paul handed out invoices to people who had stayed overnight or had booked the workshop.

Maria expressed her thanks to everyone for a very successful meeting, and especially thanked Paul for his excellent hosting and organisation, including the team meal and access to the museum.