

Guest Researcher Programme



Rafael Soares de Oliveira, Dr. Rolf Kümme
(Head Department 1.2)
(Background: 2 MN Force Standard Machine)

Rafael Soares de Oliveira works at Brazil's National Metrology Institute (INMETRO): For more than 20 years in the field of force and torque. From May to September 2022, he stayed at PTB as guest researcher.

PTB: Rafael, as guest researcher, you are staying in the department for solid mechanics.

Rafael: Exactly. During my stay here, I work in the same field as I do at INMETRO, which is the field of force and torque. There has been a partnership between INMETRO and PTB for almost three decades, so the laboratories have been working together for quite some time, and I already knew

PTB and some of the staff here from various meetings and conferences.

PTB: Right, so there was already a kind of basis, so to speak?

Rafael: Yes, indeed there is. Maybe I should also mention that INMETRO is cooperating in two EURAMET/EMPIR projects and as we (INMETRO) are not inside Europe, it was a great opportunity for us to follow the group of Europe, to see in detail what they were doing in these two projects.

PTB: And what are these projects about?

Rafael: Well, one project is looking for new ways to establish traceability in force. The name of the project is ComTraForce (Comprehensive traceability for force metrology services). And the other project is the wind efficiency project (WindEFCY) which deals with power measurement for efficiency determination of wind turbines. There, we are analysing the mechanical power – which means torque and speed – or, in other words, the role the mechanical power is playing in a nacelle test bench for wind power. So, these are two very interesting themes. The work here is really state-of-the-art as regards both quantities, force and torque. And we are not dealing with traditional loads! Here, we have dynamics inside the load's direction, and this is really something new for the areas. We have been cooperating in these two projects for almost three years now and because of that I thought it would be a good opportunity to come here and follow these activities together with the people of PTB.

PTB: So, I guess you benefit a lot from this experience. I suppose there are also other institutes involved, not only PTB?

Rafael: Yes, sure! This EMPIR project is a consortium of different institutes and then not only national metrology institutes but also universities, and we have the stakeholders, the companies which are interested in this project... so for us it is nice to have this feedback from the stakeholders.

PTB: So, you are also in contact with the other institutes and companies?

Rafael: Yes, we have regular meetings. Because of the pandemic, the meetings were mostly online ... but then, for us this was a good thing, because being in South America it was not easy to come to Europe to follow all the presential meetings and stuff like this. So, we have these regular meetings, we are always exchanging information and experience with the whole group of institutes.

PTB: I suppose wind energy is also a very relevant topic for Brazil...

Rafael: Yes, of course. Brazil has excellent conditions for wind and solar energy. And it is important that metrology is supporting the development of technologies in these areas.

PTB: Well, now we would also like to talk about how you feel in general...

Rafael: Ah, okay...

PTB: For example, how is work in Germany and what are the differences to working in Brazil?

Rafael: Let me see how I can put this... the day-by-day work is pretty much the same. For example, when dealing with some sort of equipment, I mean doing the calibration and returning the equipment to the client, that's pretty much the same. But in the field of research, I would say that PTB is more flexible receiving the researchers than INMETRO can be at this moment. So, it's better to propose doing things here and I think this is the main difference about the research.

PTB: And what about the working environment?

Rafael: I can say that the way people are treating each other here, the way the groups talk is pretty much the same in Brazil... the jokes are the same, the time for lunch is the same, the groups... we also have the same kind of thing when there is a birthday, there's a cake... yeah, it's really similar but of course in the infrastructure there is some difference. In general, I must say that adapting is rather easy to do.

PTB: That's good to hear... it really sounds quite positive...

Rafael: Oh yes, and I have to say that I feel at home here – on the one hand because of the work, and on the other hand because of the colleagues here at PTB.

PTB: That's really great and it's exactly what the programme is about, I mean... strengthen the relationships between the institutes and of course between the colleagues from different countries...

Rafael: Yes, I see it the same way... the guest researcher programme offers a good opportunity to strengthen the relationships... on the personal as

well as the professional level. Summarising, I can say that I've had a great time here at PTB

PTB: And was this your first time at PTB or have you been here before?

Rafael: I've been here before for some technical visits or meetings, but this is the first time as a guest researcher.

PTB: So, it is not your first visit to Germany...

Rafael: No, and I have already been to Germany as guest researcher at the University of Ilmenau, in the years 2014 and 2017. There was a cooperation project in the past, during my PhD period, between my university in Brazil and the TU Ilmenau. Back then, I had a chance to know a lot of people and we kept contact and continued to develop some ideas, some prototypes, we also had a patent together in the torque field, and they invited me to give some presentation, some lectures.

PTB: Ok, so obviously you are perfectly connected...

Rafael: In fact, I have been able to establish good relations over the years...now, when leaving PTB in mid-September and before going back to Brazil, I will stay for two and a half weeks at the TU Ilmenau where I will present some of the projects (EMPIR, EURAMET); It is also important to disseminate the information,

PTB: And this way you are connecting INMETRO's and PTB's work to the University of Ilmenau...

Rafael: Oh yes, if I have the opportunity, I always use it... I like making this kind of connections... also making propaganda to other colleagues at

INMETRO, always saying that we must go further in this kind of cooperation, that we must look for opportunities to get a chance to really cooperate and not stay by ourselves, doing all the stuff by ourselves... we must always try to disseminate the knowledge.

PTB: Which is fully within the spirit of our guest researcher programme.

Well, coming back to your personal experiences and impressions... is there something you like to add, maybe even something not so positive?

Rafael: Oh, I must say I really enjoyed my stay in Germany, and I would recommend coming here to Germany as guest researcher to anyone who is interested. The only negative aspect for me was being separated from my family for such a long time. I am married and have two children, aged nine and three, and being separated for five months is not that easy.

Holger Kahmann (1.22), Rafael Soares de Oliveira, Dr Rolf Kümme
(Background: 5 MN Torque Standard Machine, PTB CCW (competence centre wind energy))



2 MN Force Standard Machine



PTB: Yeah... I see, that's not so easy...

Rafael: Yes, ... but coming back to life in Germany and how I spent my free time, for example... for me, it was very nice to get to know Braunschweig which really is a nice city, a good place to live.

And I also had the chance to travel to other cities like Erfurt, Hamburg and, of course, Berlin which I really liked – a great city... really kind of different, a special city.

And regarding my experiences here in Germany? Basically, there are only positive things... I didn't have any bad experience... maybe the only thing to mention is that sometimes it's a bit of a problem to communicate with people in the streets or shops due to the language barrier – not everyone speaks English or maybe, they speak English but are a bit insecure or afraid to talk.... but in the end, it almost always worked out somehow.

PTB: What would you recommend to other persons interested in coming to Germany as a guest researcher?

Rafael: Well, first there is the technical part to be considered. You have to form an idea about what you will do here and what are the interests of the institution you work for in your home country. And you have to consider your personal situation... I mean family, money... we must see that money is an important point, especially when having a family, if you are thinking about going abroad for a longer period of time and the family might have to come along. What is less important is to think or to worry about the lifestyle in Germany... in my opinion, it is very easy to live here.

PTB: We are really happy you enjoyed your stay here at PTB and in Germany... and again, many thanks for sharing your impressions with us.

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Transcript:

Susanne Wolter | 9.11

Interview:

Dr Wolfgang Schmid | 9.11

Anja Bretschneider | 9.11

Susanne Wolter | 9.11

Photos:

Susanne Wolter,

Wolfgang Schmid | 9.11

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