

招聘機関報告書

機関名: 東海大学 工学部 工学部長 大山 龍一郎

1. 交流テーマ: ドイツ アーヘン工科大学 流体力学研究所における航空機開発のための非定常空力現象予測技術の開発の最新成果の紹介と意見交換
2. 研究者名: 同大学 同研究所 副所長 Matthias Meinke 博士
3. 期間: 平成29年11月19日から12月2日

4. 研究者の活動及びその成果に関する評価、所見

◆主な訪問先及び講演

- 11月21日(火): 株式会社ソフトウェアクレイドル大阪本社訪問。
- 11月22日(水): 第55回飛行機シンポジウム(島根・松江市)の特別セッションにおいて「Advanced Numerical Methods for Aircraft Related Aerodynamics」を講演。
- 11月23日～24日(金): 東海大学湘南キャンパスにて、大山龍一郎工学部長を表敬訪問。福田准教授および高橋准教授それぞれの研究室で研究分野の議論を実施。24日午後講演を実施し、学生と教職員約60名が参加。
- 11月25日～27日(月): 金沢工業大学学長・大澤敏教授を表敬訪問。航空システム工学科のフライトシミュレーターやジェットエンジン・ファン騒音低減研究に使用されている垂直入射管装置の見学を実施。その後、教員・学生93名(内学生89名)及び富山大の教員・学生6名(内学生5名)に対して、特別講演「Prediction of Turbulent Flows and Aero-Acoustic Noise」を実施。
- 11月28日(火): MHI 総合研究所(名古屋市港区)を訪問し技術交流を実施。
- 11月29日(水): 慶應義塾大学(矢上キャンパス)を訪問し、「Prediction of Turbulent Flows and Aero-Acoustic Noise」を講演。移動後、JAXA(調布航空宇宙センター)にて、航空機や騒音問題についての最新の研究についての講演を実施。
- 11月30日(木): 国土交通省運輸安全委員会委員長の中橋和博博士を表敬訪問。午後、新橋の航空会館で第65回公益財団法人航空機国際共同開発促進基金(IADF)講演会において、「Development and Application of a Hybrid CFD/CAA Method for the Prediction and Analysis of Aircraft Related Noise」を講演。

◆成果に関する評価、所見

Meinke 博士は、日本滞在中に様々な企業・大学・研究機関を訪問し講演と技術交流を行った。氏の研究グループが開発している解析手法は、航空機開発に対して有効な手法であり、また、既に様々な応用解析が行われていることから、各訪問先で活発な議論が行われ、手法やアイデアなど詳細な議論も数多く行うことができた。今回の訪問を通して、更なる連携のための意見交換も多く行われたことから、今後は氏のグループとこれら企業・大学・研究機関との具体的な協力関係が加速されることが期待できる。この貴重な機会の設定と実施に関して多大なるご支援を頂いた(公財)航空機国際共同開発促進基金殿に深甚の謝意を表する。



◆Meinke 博士のレポート: P. 2 参照

Report on the company and university visits from 11.20.2017 to 11.30.2017 sponsored by IADF

Matthias Meinke
Institute of Aerodynamics
RWTH Aachen University
Germany

Email: m.meinke@aia.rwth-aachen.de

After leaving from Frankfurt, Germany on November 19, I arrived in Osaka, Japan in the evening of November 20, where I met Prof. Shun Takahashi, at the airport bus station to take me to the Dai-ichi hotel.

Meeting at Software Cradle in Osaka, November 21, 2017 On the next morning of November 21, Prof. Takahashi picked me up at the hotel and we walked to the company Software Cradle. After an introduction of the company CEO, I gave a presentation with the title *Advanced Numerical Methods for the Analysis of Turbulent Flows*. Subsequently, we had an vivid discussion with various employees of the Software Cradle company on various strategies, how to solve advanced fluid mechanical problems in the field of aircraft related turbulent flow problems.

Participation at the Aircraft Symposium in Matsue, November 21-22, 2017 In the afternoon Prof. Takashi accompanied me to the airport of Itami, from where we arrived in Matsue in the afternoon. At the symposium hotel, I met Prof. Obayashi from Tohoku University, Sendai to discuss with him the progress of the student Kazuki Ozawa from Tohoku University, who at present works on his Master thesis at the Institute of Aerodynamics on a supersonic aircraft propulsion problem. On the next day I attended the aircraft symposium and gave a presentation with the title *Advanced Numerical Methods for Aircraft Related Aerodynamics*.

Visit of Tokai University, November 23-24, 2017 After the aircraft symposium Prof. Takahashi traveled with me to Atsugi. We then arrived at Tokai University, where I met also with Prof. Fukuda, who introduced to me his research field of vortex element methods. Additionally, several students gave a presentation about their research under the supervision of Profs. Fukuda and Takahashi. On November 24, I gave a presentation with the title *Simulation and Analysis of Turbulent Flows*.

Visit of Kanazawa Institute of Technology, November 25-27, 2017 I arrived by Shinkansen in Kanazawa at around noon time on November 25. I was picked up by Prof. Sasaki and had a joint dinner with him. On November 27, I visited Kanazawa Institute of Technology. First, I had a meeting with the universities president Prof. Osawa and a campus tour of the prestigious library and various facilities. In the afternoon, I attended a students seminar, in which Master and Bachelor students presented their research projects. Subsequently, I gave a presentation with the title *Prediction of Turbulent Flows and Aero-Acoustic Noise*.

Visit of Mitsubishi Heavy Industries, November 28, 2017 I arrived in Nagoya station at 12:25 on November 28, where I met Shinsuke Nishimura. We had then a meeting with several researchers from MHI. We discussed about various topics related to aeroacoustics and also the possibility for a sabbatical stay of an MHI researcher at RWTH Aachen University. After a presentation about Lattice Boltzmann Methods for acoustics from Shinsuke Nishimura, I gave a presentation with the title *Prediction of Aircraft Related Noise*. In the evening I took a Shinkansen to Tokyo.

Visit of Keio University, November 29, 2017 On the next morning of November 29, Prof. Obi picked me up and took me to Keio University. After a discussion about various topics also connected to exchange students from Keio and RWTH Aachen University and a short institutes tour, I gave a presentation with the title *Prediction of Turbulent Flows and Aero-Acoustic Noise*.

Visit of JAXA, on November 29, 2017 From Keio University I was accompanied by two Master students from Tokei University and arrived at JAXA where I was met by Drs. Yamamoto, Murayama and Sakai and also Prof. Imamura. We then had a seminar with several presentations. My presentation had the title *Prediction of Aerodynamic Noise with a Hybrid CFD/CAA Aeroacoustics Method*. We then discussed about a student exchange of one RWTH Aachen University student going to JAXA and a Tokyo University student supervised by Prof. Imamura coming to Aachen. In the afternoon we had an interesting tour through the JAXA wind tunnel facilities.

Meeting with Prof. Nakahashi, Japan Transportation Safety Board, November 30, 2017 In the morning of November 30 I met Prof. Sasaki who guided me to the Japan Transportation Safety Board. There we met Prof. Nakahashi with whom we had a brief discussion about safety of all transportation systems in Japan. Subsequently, we attended an interesting presentation on aircraft flight recorders.

Seminar at IADF, November 30, 2017 At around noon we arrived at IADF, where we met several representatives of IADF. After having a joint lunch, I gave a presentation with the title *Development and Application of a Hybrid CFD/CAA Method for the Prediction and Analysis of Aircraft Related Noise*. After the presentation I met Prof. Nakashi for dinner and then traveled to Narita airport. I arrived back in Germany on December 1.