

**Michael Schmiechen**

From: "Michael Schmiechen" <[m.schm@t-online.de](mailto:m.schm@t-online.de)>  
To: "Naoji Toki" <[toki.naoji.mz@ehime-u.ac.jp](mailto:toki.naoji.mz@ehime-u.ac.jp)>  
Cc: "Kuniharu Nakatake" <[nakatake@aqua.plala.or.jp](mailto:nakatake@aqua.plala.or.jp)>  
Sent: Monday, January 09, 2012 3:39 PM  
Subject: Quasi-Steady Propulsion Tests

Dear Professor Toki,

many thanks for your kind interest in my work. Of course I remember you and our discussions at Kobe 1987. I remember that we, my wife and myself, came via South-Korea, where I have been lecturing on my ideas at various institutes, via the famous 'battlefield', the Straits of Tsu-shima, visiting Professors Kijima, Nakatake and Fukuda at Fukuoka, and travelling Kyushu before proceeding to Kobe.

For distribution at my lectures I had prepared a little A5 brochure with the title 'Wake and Thrust Deduction from Quasi-steady Ship Model Propulsion Tests Alone'. The dedication on the title page reads as follows: 'Published on occasion of visits to Korean and Japanese ship research institutes and the 18th ITTC at Kobe in October 1987 in commemoration of the 4th ITTC at Berlin in May 1937'.

The reason for referring to the ITTC at Berlin was not just the 50th anniversary, but the fact that similar ideas of Horn had already been tested by various institutes, among them a Japanese tank, and the results have been presented and discussed at Berlin! Due to the poor conceptual framework, poor instrumentation and computational capabilities the results have been quite unsatisfactory and the development has been disrupted by the war.

The results in my brochure, fifty years later, have also been quite unsatisfactory, but for different reasons. The evaluation now, mentioned further down, is perfect, and I consider it as a triumph of Horn's early vision and his (Berlin) paradigm. I think that CFD, the triumph of Weinblum's (Hamburg) paradigm, is a wonderful tool, but it does not solve any of the conceptual problems we are facing. I observe that student now often do not know, forget understanding, the simplest facts of elementary mechanics and hydromechanics.

Before I come to answer your specific question please let me provide you with a short survey of my work on propulsion, the development of my rational theory of propulsion, which started 1961, exactly fifty years ago, when I realised during my first model tests, how hull propeller interaction works. And in the first place this was not a matter of advanced instrumentation, maybe of advanced computational facilities, but of a clear understanding of physics and corresponding advanced conceptual approaches.

One resulting branch of work has been the design of (energy!) wake adapted propulsors as pumps. In view of the fact that no interaction data are available at the design stage, in my approach all interactions are treated

implicitly. There is no need for the naive (!) conception of propulsors as thrusters overcoming resistances of vehicles to be propelled. The concept of thrust does not occur in the design process as in pump design!

Another branch of work has been started 1980, when I realised that the traditional powering performance analysis will never work full scale under service conditions. The first full scale tests using my conceptual framework took place on board the METEOR in the Arctic Sea in November 1988.

The results, including 'measured' scale effects in thrust deduction and wake fractions, have been subject of the 2nd INTERACTION Berlin '91. My workshop has been attended among many others by all members of the ITTC Powering Performance Committee under their Chairman Kuniharu Nakatake!

The last branch of work has been concerned with the evaluation of traditional trials. It started when I saw the Japanese draft proposal for the ISO standard, promoted by the convener Prof. Ikehata. Based on a half sentence in my METEOR report I immediately realised, that the proposal resulted in erroneous results and informed all bodies involved accordingly.

The complete documentation of the correspondence is to be found in the section 'Papers on ship speed trials' under 'On the evaluation of ship speed trials'. Despite my results the standard has been approved and even after ten years ISO 15016: 2002-06 is felt not to need any revision.

My very robust method needs no reference to the theory of interaction at all and thus to any prior information, model test results in particular, as it must be. The key problem is to identify the current velocity reliably. In the mean time HSVA and MARIN have adopted my approach.

On my website [www.m-schmiechen.de](http://www.m-schmiechen.de) you find the three sections on 'Propulsion in general', 'Ship speed trials' and 'Ducted propulsors' with all my work on propulsion, all original innovative work of interest to you and your students. All sections are divided into 'News ...', 'Papers ...' and 'Bibliography ...', so you may like to check all of them.

The sections on 'General subjects' and 'Mechanics in general' contain fundamental background studies. You may also like to inspect my opus magnum 'On Newton's Principles and related principles', Volume 3, 'On global and propulsion mechanics', in particular. Details to be found in the 'Bibliography on mechanics'.

Concerning the technique of quasi-steady propulsion tests I suggest that you inspect 'A 'model' test' in the section on 'News on propulsion in general'. The model test analysed according to the latest state of development has been performed before the METEOR tests and has since served as my realistic (!) test case. Please note that my test took only little more than two minutes and no hull towing and propeller open water tests being required!

As you will see, my results compare very well with the results of the traditional procedure, except where this is impossible by definition, i. e.

due to different definitions. In my case there is only one wake and thus no rotative efficiency.

My colleague Dr. Klaus Wagner of Rostock, whom I met first after the re-unification of Germany at my 2nd INTERACTION, has constructed simple examples for educational purposes. I will find out after his vacation, whether these are also available in English.

I personally do not 'believe' in constructed test cases as I have explained in detail on my website after my negative experience with the EVEREST data constructed by Prof. Tamura. Colleagues always want to compare numerical results, but I am talking about innovative conceptual solutions of problems they do not even address, forget about solving!

In view of all my results, published world wide on many different occasions, I find it surprising how long it takes naval architects before they take interest in and understand the simple principles of my ideas and their dramatic theoretical, practical and economical advantages.

Having worked at VWS for forty years, competing with all other model basins, I find this lack of curiosity and imagination surprising, not to say incredible. How could it possibly happen that, except for Dr. Wagner, for decades nobody took part in the discussion of problems and in the development of solutions absolutely fundamental to our profession?

This letter is certainly not the short answer you have been asking for. As you will see from the variety of documents on my website, there is not just one simple answer, but a whole range of related ideas and procedures. Most of the documents on my website are in English and all of them are pdf files to be down loaded.

Please feel free to contact me with any specific questions you may have and also tell your students, that they may contact me any time. I am of course also prepared to give a course of lectures at Matsuyama and/or Fukuoka as I did before at NSTL Visakhapatnam in India and at MARIC Shanghai in China. All the presentations given have been distributed as A5 brochures and are of course to be found on my website.

So quick, so much, as always (still) in a hurry  
with my best wishes for the new year  
yours, Michael Schmiechen.

PS. In 2011 I have added contributions to my website as follows: a proposal for the revision of the standard DIN 1313: 1998-12 on concepts and magnitudes, alias 'quantities', a paper on the performance of ducted propulsors and, last but not least my final lecture on 'Professional problem solving' after forty years of lecturing on 'Hydro-Mechanical Systems [Engineering]'. The pertinent sub-sections contain not only papers and presentations, but all related discussions etc, though admittedly mostly in German this time.

From: <[toki.naoji.mz@ehime-u.ac.jp](mailto:toki.naoji.mz@ehime-u.ac.jp)>  
To: <[m.schm@t-online.de](mailto:m.schm@t-online.de)>  
Cc: <[nakatake@aqua.plala.or.jp](mailto:nakatake@aqua.plala.or.jp)>  
Sent: Sunday, January 08, 2012 8:39 AM  
Subject: Quasi-Steady Propulsion Tests

Dear Dr.Schmiechen,  
CC: Prof. Nakatake

I hope you remember me who had been working at Mitsubishi's Nagasaki Basin and met you in a few occasions. I got your address by asking Prof. Nakatake. I am now teaching Naval Architecture at a local university, and Prof. Nakatake is helping me to give a series of lectures on wing and propeller theories.

I remember that you intensively claimed the usefulness of quasi-steady test in the resistance and propulsion field while I met you during 18th ITTC in Kobe. At the time I thought conventional procedure was more effective and we did not have to change our test procedure, however, now we can obtain quite sophisticated equipments in cheap prices and situation is quite rapidly changing. So now, I like to study your proposal.

I found one contribution from you to the Powering Performance Committee in the proceedings of 18th ITTC, titled "Wake and Thrust Deduction from Quasisteady Propulsion Tests Alone". However it is only a short comment and has no reference. Could you please recommend your publication(s) written in English, by reading which the reader can understand the essence of your proposal? If you can send me pdf file(s) of the publication(s), I would be most grateful.

-----  
Naoji Toki: Professor, Dr. of Engineering  
Ehime University, Graduate School of Science and Engineering  
Special Course of Naval Architecture  
3 Bunkyo-cho, Matsuyama, Ehime 790-8577, Japan  
Tel. +81-89-927-9713  
E-mail: [toki.naoji.mz@ehime-u.ac.jp](mailto:toki.naoji.mz@ehime-u.ac.jp)  
-----