

はしがき

1977年8月から1年間文部省在外研究員としてStuttgartのMax-Planck研究所Kronmüller教授のもとで過ごした。私は研究者としては駆け出しのころで、赴任した岩手大学でも東北大学博士課程での研究テーマ金属間化合物の「誘導磁気異方性と転位」の研究を継続していた。Kronmüller教授は長年鉄、ニッケル、コバルトなどの単体金属の「磁性と転位」の研究してきたこの分野の世界的な権威者であった。「磁性と転位」という共通点はあったが、単体金属と金属間化合物では相互作用のメカニズムは全く異なる。Kronmüller教授は彼らの研究成果を非破壊評価に応用することを目指していた。私は実用化の研究には全く関心がなく、滞在中はこの問題に距離を置いていた。帰国後も私の興味は専ら学術的な研究であった。その後十数年間金属間化合物の磁性と転位の研究を続けた。その間、時代は社会に役立つ研究を求める風潮が強まっていった。私もこうした風潮に対応せざるをえなくなった。2001年に「磁性と転位」の研究を金属材料の非破壊評価に応用するため、金属材料保全工学研究センターを設立した。原子炉圧力容器の経年劣化に対する非破壊検査のための基礎研究を行う省令施設である。Kronmüller教授の考えの具現化でもあった。彼は常に適切な助言と強い励ましを寄せてくれた。

原子力材料の非破壊検査の研究をするためには一研究センターだけでなしうる仕事の限界を感じ、国際的なネットワークを作る必要性に迫られた。米国でJiles教授と国際的なネットワーク設立を話し合った。また、本センターの3周年記念行事に合わせて招聘したKronmüller教授の助言を下に、設立に向けて奔走した。14カ国16研究機関の賛同の下に2005年9月Wienで第1回目の会議を開いた。その会議で磁気利用の非破壊評価の基準化についても話し合い、第2回目のPragueの会議でランドロビン試験の具体的な実施方法を決めた。

国際ネットワーク設立時には全てのメンバーが「磁性と転位」について十分な基礎知識を持っているものと思っていたが、議論を重ねるにしたがって私の期待を修正する必要を認識した。磁気利用の非破壊評価の基準化作りに際し、「磁性と転位」の共通認識を1歩1歩築くことが最終目標に辿り着く近道であることが分かった。この冊子では磁気利用の非破壊評価の基準化作りのための共通認識の形成過程を記した。この共通認識の上に立ち第2回目のランドロビン試験が2009年1月に始まった。2011年は基準作りの節目になることを祈りこの冊子を記す。

この冊子の主眼は英文部分である。ランドロビン試験結果を纏め基準化の方向を示したもので、これを参加した全グループに送った。送付の際に付け加えたメールの前文および手紙をこの後に載せた。文面から基準化の道のりが如何に厳しいものかを読み取って頂ければ幸いである。また、第2回目のランドロビン試験を始めるに際し、第1回目のランドロビン試験の教訓を基に測定・解析するよう全グループに指示した文面も付け加えた。

2009年2月15日

高橋正氣

ラウンドロビン試験解析結果を送ることを知らせるメールの前文（2008年11月25日）

Dear UNMNDE members

2008, 11, 25

The first Round Robin Test has been finished and the results were discussed in Budapest meeting. The final conclusion is not clear for me but we need the standardization of magnetic NDE. We meet many engineers and scientists who are interested in magnetic NDE. They believe all magnetic properties are appropriate for NDE of the degradation before the crack initiation without the experience and knowledge of magnetic NDE. We have to show the correct direction of magnetic NDE to them. I made a report of Round Robin Test for the standardization of magnetic NDE and sent it to all the UNMNDE members by the normal mail with CD last Friday. If you receive it, please inform me the reception. And I am pleasure if you send your comment or remark after your reading.

Sincerely yours
Seiki Takahashi

ラウンドロビン試験結果を郵送した手紙（2008年11月21日）

Dear UNMNDE members

Round Robin Test was carried out successfully and the results were discussed in Cardiff and Budapest meetings. The present attempt would be the first time through the history and the data includes variable information. We need the conservation of our data to make good use of the practice of magnetic NDE. The second Round Robin Test will start soon. We need the evaluation to the first Round Robin Test to get better results in the second Round Robin Test. I have made a report on Round Robin Test and send it to all the members of UNMNDE.

I am waiting for your comments, advice, arguments or suggestion and wish to conserve the complete report adding your idea.

I am looking forwards to receiving your early answer.

Sincerely yours
高橋正氣（署名）
(Seiki Takahashi)

第2回目のラウンドロビン試験を始めるに際し、前回の教訓を基に測定・解析するよう指示したメール（2009年1月9日）

To all the members of UNMNDE

The second Round Robin Testing has started now. The size of samples and their preparation are shown in the additional note that had been sent to you last November. The samples will be relayed one by one. The Round Robin Testing will bring us the useful results of magnetic NDE. I submit proposals for the smooth execution of Round Robin Testing.

Proposals for the second Round Robin Testing

A proposal was shown on the basis of the results of the first Round Robin Test that *coercive force* in closed samples is one of the standard properties of magnetic NDE. I would like to ask to all the members to compare your results with *coercive force* in your measurement. It is hoped that coercive force is measured in closed samples by each member in principle. Other standard magnetic properties would be Rayleigh constants, hysteresis loss and initial susceptibility in closed samples. They should be measured by as many groups as possible. The other properties such as minor-loop properties and Barkhausen properties should be compared with coercive force by each group and the agreement of their trend should be checked. The different trend is expected to be explained.

The schedule of Round Robin Testing has been prepared according to the preference of each group and appears in the table. The Round Robin Testing should proceed rigidly according to the schedule. I shall confirm the execution of schedule to contact with the group. Then, please send the mail to me when you send the samples to the next measuring group, and when you receive them.

The results would be compared and discussed in Torino meeting. I shall make the materials for discussion according to your results by the end of August. It is helpful for me that you send your data soon after your measurement or until August 20th 2009. We can give you the information on coercive force that has been sent to me, if you need. You can get the information directly from the group that has been measured. The final comparison and the summery would be made in the 2010 meeting.

I expect to have your idea, comments, opinions or suggestion for the Round robin Testing.

With best regards
Seiki Takahashi

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