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Institute of Mathematical Analysis (represented by H. Isshiki)

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Motto: We challenge risk boldly, deduce conclusion rapidly, create new business chance and contribute to revitalization of Japanese economy.

IMA (Institute of Mathematical Analysis) news is delivered every month. You can also download it from homepage (<http://www.hi-ho.ne.jp/issiki/>).

R & D in Our Institute: Precise Positioning by GPS in the Ocean

R & Ds on GPS conducted by our institute are closely related each other. Seemingly, there are no relations between the Underground GPS and the Precise Positioning by GPS in the ocean. In a certain sense, they are almost the same problem. Including the positioning problems on surface of a planet such as Mars, the key point is how to determine the initial phase ambiguities reasonably. On the precise positioning in the ocean, a perfect answer has not yet been given.

So to speak, the problem is in a deadlock. A breakthrough is looked for. However, the answer may not emerge from the people who have been struggling in this field for many years. Their rich knowledge may form a stereotype, and it hinders to make a breakthrough. Since the author entered into this field from a completely different discipline, he can develop ideas freely. In this sense, the author may stand on a favorable position.

Now, the author has obtained an idea and is checking its validity. So, he can make a report in a near future. The algorithms for the determination of the initial phase ambiguities are very highly developed. It's pretty difficult merely to understand them. It is a problem to estimate the correct physical quantity buried in very noisy signal. The mathematical theory seems complete. However, when the baseline length (distance between the reference and observation receivers) becomes long, the method fails. The reason is that the problem goes beyond the coverage of the theory.

This means that it's not a problem of improvement of the existing theory but a problem how to make a new frame. The author believes that the true solution may exist in this approach. On this basis, a strong belief that the problem can be solved will bring a chance to obtain the solution.

Jobs in April

- (1) Data analysis of a high precision GPS (Long baseline kinematic)
- (2) Proposal for practical use of an Underground GPS (Initial phase ambiguity)
- (3) Software development on modulation and demodulation of communication (Software development of wavelet)
- (4) Preparation for the demonstration of a high sensitivity GPS

Schedule in and after May

- (1) Data analysis on a high sensitivity GPS (Long baseline kinematic)
- (2) Proposal for practical use of an Underground GPS (Initial phase ambiguity)
- (3) Basic study on modulation and demodulation of communication (Software development of wavelet)
- (4) Acceptance notice of an abstract to ION GPS 2002 (Sept., Portland, Oregon)

<http://www.ion.org/meetings/meetings.cfm#gps>

- (5) Presentation of a paper at the Spring Meeting for the Society of Naval Architects of Japan

<http://www.snaj.or.jp>

Essay: Japanese Way of Thinking

Recently, Mr. J. Koizume, the prime minister of Japan, visited Yasukuni Shrine to attend the spring festival. His answer to the question whether he visited the shrine as a public official or as an individual was that he visited as Mr. Junichiro Koizumi as the prime minister. It's rather vague whether this is an answer to the question or not. The aspect that the author wants to discuss is another aspect.

The reason why he attended the spring festival is that he received a very strong protest from China and Korea when he tried to visit the shrine on the end of war memorial day last summer to remember the memorial of the war dead. The both country protest because the 13 A-class war criminals of the Second World War are included in the war dead enshrined there. The both country suffered very big damage at the war. So, they can't allow Mr. Koizumi's behavior.

Perhaps, people in most countries may agree Chinese and Korean's protest. It's completely right to memorize general war dead. However, if the A-class war criminals are included among them, it can't be approved. Theoretically, this is correct, but Japanese has a little bit different thinking.

Japanese people do not ask the sin of the dead. This is an implicit rule in Japan, and this may originates from Buddhism. When they die, their sin is canceled, and they become equally disciples of Buddha. There may be many opinions on this idea. The author wonders if this idea is accepted worldwide. This idea may be local rather than universal.

Mr. Koizumi visited Yasukuni Shrine in spring, since he was protested when he visited in summer. Chinese and Korean people may not accept this idea. They may think Mr. Koizumi makes fools of Chinese and Korean people. The reason why he shouldn't visit the shrine is replaced with when he should visit, without notice.

This kind of Japanese way of thinking that may bring misunderstanding is not this case alone. People don't ask punishment for unfavorable behavior of a drunken person. Generally speaking, they are very generous toward this kind of person. These habits may originate from the fact that many people live friendly in a narrow land surrounded by seas. Since seas surround Japan, there is no refuge. So they can't make things very clear. Some kind of vagueness is required to keep peace and harmony among people.

It is very important to cherish traditional way of thinking. However, we should notice that it might bring distrust of other countries in a global age like today.

Link: <http://www.teruya.co.jp>