

Precision of the time-domain correlation ultrasonic flowmeter

Med. & Biol. Eng. & Comput., 1992, 30, 672-673

Dear Editor—In the July 1991 issue of *Medical & Biological Engineering & Computing*, a communication was published ('Precision of the time-domain correlation ultrasonic flowmeter' by İ. Güler and N.F. Güler, 29, (4), 447-450) which showed a high degree of similarity to work published by one of my former students in his doctoral thesis (EMBREE, 1986). I would like to make the following comparison between the two documents.

The GÜLER and GÜLER (1991) communication consists of three sections. Section 1 has 55 lines of text, 16 of which are essentially the same as text on page 4 of EMBREE's (1986) thesis. Section 2 has 60 lines of text, all 60 of which are essentially the same as the text on pages 27-32 of EMBREE's (1986) thesis. Section 3 has 86 lines of text, 83 of which are essentially the same as text on pages 25 and 32-35 of EMBREE's (1986) thesis. In total, out of a total of 201 lines of text, 159 lines (or 79 per cent) are essentially the same as the text of EMBREE's (1986) thesis.

The GÜLER and GÜLER (1991) communication contains 27 equations. Their eqns. 1-25 are essentially the same (different notation only) as eqns. 10-34 of EMBREE's (1986) thesis, respectively. And, their eqns. 26-27 are essentially the same (different notation only) as eqns. 9 and 35 of EMBREE's (1986) thesis, respectively.

The GÜLER and GÜLER (1991) communication lists seven references. The two references of HELSTROM (1960) and FOSTER (1985) are referred to three times each. All three of the Helstrom citations and two of the three Foster citations in the GÜLER and GÜLER (1991) communication are at the identical locations as those in EMBREE's (1986) thesis.

The GÜLER and GÜLER (1991) communication has two figures. These two figures appear to be exact copies of Figs. 7 and 8 from Embree's thesis, save for the change in fount of the axes. Also, the referencing of these two figures within the GÜLER and GÜLER (1991) communication are at the same locations as those in EMBREE's (1986) thesis.

Given the similarity of the two contributions, it is surprising that GÜLER and GÜLER (1991) did not reference the work of EMBREE (1986), or, for that matter, the publications of Embree which resulted from his excellent thesis research (EMBREE and O'BRIEN, 1990; FOSTER *et al.*, 1990). It is further surprising that in the peer-review process some of the authors' work was not improved and corrected.

References

- EMBREE, P. M. (1986) The accurate ultrasonic measurement of the volume flow of blood by time domain correlation. Ph.D. Thesis, University of Illinois at Urbana-Champaign, USA.
- EMBREE, P. M. and O'BRIEN, W. D. Jr (1990) Volumetric blood flow *via* time-domain correlation: experimental verification. *IEEE Trans.*, **UFFC-37**, 176-189.

FOSTER, S. G. (1985) A pulsed ultrasonic flowmeter employing time domain methods. Ph.D. Thesis, University of Illinois at Urbana-Champaign, USA.

FOSTER, S. G., EMBREE, P. M. and O'BRIEN, W. D. Jr (1990) Flow velocity profile *via* time-domain correlation: error analysis and computer simulation. *IEEE Trans.*, **UFFC-37**, 164-175.

GÜLER, İ. and GÜLER, N. F. (1991) Precision of the time-domain correlation ultrasonic flowmeter. *Med. & Biol. Eng. & Comput.*, **29**, 447-450.

HELSTROM, C.W. (1960) *Statistical theory of signal detection*. Pergamon Press, Oxford.

William D O'Brien Jr, Department of Electrical & Computer Engineering, University of Illinois, 1406 West Green Street, Urbana, IL 61801, USA.

Received 9th March 1992

The authors' reply—The idea of a time-domain correlation ultrasonic flowmeter was first introduced by Foster (FOSTER, 1985; FOSTER *et al.*, 1990) and developed by Embree (EMBREE, 1986; EMBREE and O'BRIEN, 1990), further discussed in detail by Güler (GÜLER, 1990).

Many papers of mine have been published in various conference proceedings and journals (GÜLER, 1988a; b; c; GÜLER and GÜLER, 1991) on the same subject. These obviously show that we have also been working on a time-domain correlation ultrasonic flowmeter. My research group is still working on the same subject. Therefore we have a considerable amount of knowledge and have performed a considerable amount of work on the subject.

I agree that the first significant work was carried out by Professor O'Brien Jr and his group. But this does not mean that everything in my paper has been carried out only by them and they are not the only group working on time-domain correlation flowmeters. I have always referenced Professor O'Brien and his group when necessary.

References

- EMBREE, P. M. (1986) The accurate ultrasonic measurement of the volume flow of blood by time domain correlation. Ph.D. Thesis, University of Illinois at Urbana-Champaign, USA.
- EMBREE, P. M. and O'BRIEN, W. D. Jr (1990) Volumetric blood flow *via* time-domain correlation: experimental verification. *IEEE Trans.*, **UFFC-37**, 176-189.
- FOSTER, S. G. (1985) A pulsed ultrasonic flowmeter employing time domain methods. Ph.D. Thesis, University of Illinois at Urbana-Champaign, USA.
- FOSTER, S. G., EMBREE, P. M. and O'BRIEN, W. D. Jr (1990) Flow velocity profile *via* time-domain correlation: error analysis and computer simulation. *IEEE Trans.*, **UFFC-37**, 164-175.
- GÜLER, İ. (1988a) A time domain modeling of blood flow profiles by using computer simulation. Proc. Int. AMSE Conf. Modeling and Simulation. Istanbul, **4A**, 53-68.
- GÜLER, İ. (1988b) A novel method for the measurement of flow direction in pulsed Doppler systems. IEEE Eng. in Med. & Biol. Soc., 10th Ann. Conf., New Orleans, 4th-7th Nov., 236-237.

- GÜLER, İ. (1988c) A method for determining the Doppler angle in pulsed Doppler flowmeters. *IEEE Eng. in Med. & Biol. Soc. 10th Ann. Conf.*, New Orleans, 4th–7th Nov., 227–228.
- GÜLER, İ. (1990) The analysis of error sources in an advanced ultrasonic blood flowmeter. Ph.D. Thesis, Technical University of Istanbul, Istanbul, Turkey.
- GÜLER, İ. and GÜLER, N. F. (1991) Precision of the time-domain correlation ultrasonic flowmeter. *Med. & Biol. Eng. & Comput.*, **29**, 447–450.

İ. Güler and N. F. Güler
Dr İnan Güler, Department of Electronic Engineering,
Erciyes University, Kayseri 38090, Turkey.

Received 3rd July 1992

Editorial comment—Professor O'Brien's letter raised the very serious suggestion that Güler and Güler, in their communication of 1991 published in *MBEC*, had plagiarised the work which appeared in Embree's thesis (1986). I have examined the evidence with the assistance of independent referees and some members of the Editorial Board of *MBEC*, and I am convinced that the allegations are justified.

Dr Güler's response, published here, does not provide any explanation as to why he reproduced complete passages of Embree's thesis in the communication submitted to and published by *MBEC* without attributing the material to Embree. Dr Güler states that: '... I have always referenced Professor O'Brien and his group when necessary'; clearly this is not the case.

When incidents such as this occur, all those involved with the many facets of peer-review naturally ask if the occurrence should have been prevented, and if any more could be done to avoid a recurrence; Professor O'Brien rightly raises this point in his letter. Journals such as *MBEC* rely upon the support given willingly by referees, and in my short time as Editor I have been more than impressed with the dedication to their task shown by our reviewers. Having examined the present case, I am entirely convinced that the refereeing process used at the time was properly conducted by world-class experts who could not have known of the detailed contents of the Embree thesis. Unfortunately, it seems that it is possible for any system to be abused, and ultimately we have to rely on mutual trust and respect, and professional behaviour.

Those readers who have submitted papers to *MBEC* over recent months will know that I have introduced certain changes in procedure in an attempt to encourage authors to reflect on the matters of authorship and acknowledgment when they prepare their papers. I know from personal experience that these are often controversial issues, even at a local level.

Putting this regrettable issue aside, I believe that *MBEC* will continue to offer a vehicle for the publication of high-quality material, and I look forward to receiving further submissions from all of our contributors in the future.

Professor Peter Rolfe
Editor in Chief

23rd September 1992