Molten Metal Oscillatory Behaviour in Advanced Fusion-based Manufacturing Processes

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Propositions

accompanying the dissertation

Molten Metal Oscillatory Behaviour

in Advanced Fusion-based Manufacturing Processes

by

Amin Ebrahimi

1. A good agreement between numerical and experimental results does not necessarily verify the reliability of numerical predictions. (*This dissertation*)
2. Any generic simulation employed to predict the shape of melt-pools in fusion welding and additive manufacturing of metallic materials should account for fluid dynamics. (*This dissertation*)
3. Employing an incorrect assumption or approach in a scientific field, no matter how widespread or for how long it has been considered standard practice, does not make it right. (*This dissertation, Chapter 3, 5 and 6*)
4. The conventional fast Fourier transform (FFT) analysis should not be employed to describe the transient features of melt-pool oscillatory behaviour. (*This dissertation, Chapter 7 and 8*)
5. The merit of a good scientist is rooted in the robustness of the processes (s)he develops to address a problem rather than the results (s)he produces; however, in academia, the merit is currently evaluated based primarily on results.
6. If everything works perfectly in a research group, someone is not doing his/her job properly.
7. In a world with limited shared resources, the notion of borders is redundant, causes conflict and jeopardises peace.
8. The contribution of a referee to the clarity of a scientific article is sometimes more than that of some of the authors.
9. The number of highly-educated people trained in a country does not necessarily correlate with the technological advancement of that country.
10. Prospective doctoral and post-doctoral researchers should discuss the long-term plans of their supervisors during intake interviews.
11. The results of low-order statistical analyses should not be employed for decision making about a system with complex behaviour.

These propositions are regarded as opposable and defendable, and have been approved as such by the promotors prof. dr. I. M. Richardson and prof. dr. ir. C. R. Kleijn.