

Invitation for expression of interest

Optical frequency standard research project

Notice to: Managers in electrical and physical metrology areas of NMI's in Africa (and directors), and all others to whom it may concern

Background: South Africa is currently preparing to do research on new generation optical frequency standards based on optical fibre technology. The aim that such standards can eventually be fairly small, portable and robust and that it be designed with these principles in mind from the start. The frequency standard also could be applied to length, optical communication and time metrology (the latter with the addition of an optical frequency comb synthesizer). The related technology also has application in chemical gas metrology and even thermometry (via the temperature dependent Doppler broadening of atomic and molecular absorption lines). The whole philosophy is to create a standard that is much more suitable for use in the African environment, than the very involved conventional laser cooled atom or ion clocks, on which much research has been done in the past 20 years, albeit at some loss in accuracy. It is highly desirable for example that such a setup could even be shipped for comparisons on the African continent, and that it could nearly operate in turnkey fashion. This approach is essentially addressing the niche for a previously complex standard for use in developing countries and is built around pragmatism. The research work is still complex in order to bring the project to fruition and relatively expensive compared to some of the other established metrology areas, but nonetheless participation could be possible for suitably qualified partners in the context of photonics research.

Invitation: There is a chance of partnering on the current South African optical frequency standards/photonics technology project, with the aim of possibly expanding it to an AFRIMETS project in the future. Current possibilities at the moment could be studentships or guest researchers, with the aim of technology transfer. In the future there could even transnational sharing of the tasks, if infrastructure is in place elsewhere. We would need to work on funding as well to operate this project in the context of the AFRIMETS context. At the moment the request is therefore only for expressions of interest, and final participation depends critically on scientific competency in photonics or related areas (atomic, molecular and optical physics, electrical engineering, fibre optics etc.) and the ability to obtain the appropriate funding and the backing of your NMI (and implicitly your government). The primary purpose of this notice is therefore for information purposes and to make contact.

Guidelines: Please contact Shравan Singh (Research Manager, NMISA) or Johan Burger via email and write down possible areas where you would like to contribute/participate and how you think you can add to the project. Please list relevant background and experience of relevant people. Since this is research the work is only relevant to people with a B.Sc.Hons (Physics) or B.Eng. (Electrical Engineering) degree, and actually mostly to people with postgraduate experience beyond that level.

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