



GRANT REPORT

PLEASE COMPLETE THIS FORM IN BLOCK CAPITALS

Project Funding Application No:
(TO BE COMPLETED BY QUIPROCONE ADMINISTRATOR)

Individual Name: ...Martin Plenio.....

Organisation Name:
Imperial College of Science, Technology and Medicine

Membership No:

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DESCRIPTION OF ACTIVITY:

We had applied for support to implement a number of collaborative visits between my QIT group at Imperial College and Dr. Koenraad Audenaert (Department of Engineering, Katholieke Universiteit Leuven, Belgium) to allow us to work together using advanced methods of matrix analysis and optimisation techniques in quantum information theory. The following activities have been planned

- Study and computation of asymptotic entanglement measures and the development of new methods to derive sharper upper and lower bounds for entanglement measures and the investigation of the additivity of the entanglement of formation.
- Lectures by Dr. Audenaert to my group on those aspects of optimisation methods and matrix analysis that could be of relevance to the field of QIT.
- Discussions to identify further applications of optimisation methods and matrix analysis to problems in quantum information theory.

OUTCOME/DELIVERABLE:

The collaboration that is being supported by this grant is successful. It has led to

- Joint publications:
 - K. Audenaert, J. Eisert, E. Jane, M.B. Plenio, S. Virmani and B. DeMoor, "The regularized relative entropy of entanglement." Physical Review Letters **87**, 217902 (2001) (Work mostly done before grant started)
- Continued and more intense collaboration with Dr Audenaert on entanglement of formation and distillable entanglement both in finite and infinite dimensional systems.
- As a consequence of this grant Dr Audenaert has now joined my group as a research associate for 10 months in the first instance supported by EPSRC and the EU.
- Dr Audenaert has presented some lectures on matrix theory to my group.
- My research group continues to benefit greatly from the expertise of Dr Audenaert in matrix analysis and optimization theory and we expect a number of results to be published in 2002.

Signed:
Martin Plenio.....
Member

Signed:
Quiprocone Administrator/Co-ordinator