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South African Astronomy in the Internet Era: exploiting the AVO

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The combination of SALT, the bid to host SKA and the association with HESS have propelled South Africa into a world-class position with regard to multi-wavelength observational facilities, indicating the scale of their hopes and aspirations post-1994. All of these facilities exploit the geographical advantage that South Africa possesses, combined with substantial international collaborations to share the financial burden, whilst benefitting the infrastructure and development of South African science and industry. However, the effective use of SALT (and which is far more critical for KAT, an SKA technology demonstrator) requires dramatic improvements in both the local and international Internet bandwidth, which lags far behind First World norms (in terms of both the data rates available and their cost). Such connectivity is essential for raw data transfer from telescope to data centre, and then subsequent access by (national and international) users of the processed data. Current capabilities are stretched to the limit by SALT operations alone (which are measured in terms of Gb/night), but completely different solutions will be needed for KAT and SKA (which require Gb/s). Potential solutions for both South African and international users of SALT are being developed which exploit the Astrophysical Virtual Observatory (AVO) and Grid concepts and the substantial international investment that is currently ongoing. A collaboration with the UK's AstroGRID is acting as a testbed in which the raw data archive will remain in Cape Town at SAAO, but AstroGRID will act as a front end for setting up data pipelining procedures from which only mostly reduced data need be transferred to the end user. Comparisons with other remote international facilities (e.g the observatories in La Palma, Spain) plus the infrastructure required for KAT will be presented and discussed.