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Synthetic history of the SRT project

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Abstract. A brief overview is given of the origin of the SRT project.

In a way the very beginning of the SRT, that is of a radiotelescope in Sardinia, may be traced back to the mid 1970's when at the Istituto di Radioastronomia (IRA) of the National Research Council (CNR), we were pondering several ideas in order to expand the instrumental facilities of IRA after more than ten years since the coming in operation of the "Northern Cross". This matter was discussed for a while, also involving the opinion and advise of several fellow radio astronomers from other institutions, in particular Ken Kellermann, then at the Max-Planck-Institut für Radioastronomie in Bonn, and Richard Schilizzi, then at the Netherlands Foundation for Radioastronomy. Finally, it was decided to work out a proposal providing the construction of one or more radiotelescopes with operational priority for the Very Long Baseline Interferometry (VLBI).

The main guidelines were:

- a significant contribution to the science potential of the European VLBI Network (EVN), so as to establish the international interest of the project;
- the possibility of observing up to a reasonably high frequency, so as to enhance the science and expand the technological competence of IRA;
- a reasonable flexibility, in view of the uncertain financial resources that might have become available;
- a location of the antennas that could be of interest for geodynamical studies as well, so as to foster the use of the VLBI technique for the precise monitoring of the crustal motions and promote the interdisciplinary interest of the project.

In its final form the proposal, submitted for the approval of the CNR Board in 1978, foresaw the construction of three identical radiotelescopes, one in Medicina (close to the Northern Cross), one in the southern tip of Sicily (of particular geodynamical interest) and the third one in Sardinia. It was conceived that each telescope should have a 32-m diameter fully steerable parabolic antenna with a surface accuracy enabling operations up to a frequency of 23 GHz. Following a pioneering project supported by NASA to monitor the region of the San Andreas Fault (California), the proposal also foresaw the construction of a mobile VLBI station in order to perform geodynamical measurments at different locations. The overall proposal was fully endorsed by the "Geodynamics" Project, a nationally-oriented research programme operated by the CNR.

Despite the favourable impression and the scientific interest raised by the proposal, the financial resources available to the CNR were such that the full project could not be supported. A descoping became necessary: funds could be committed for only two out of the three radiotelescopes originally proposed, and also the mobile VLBI station could not be funded. It was clearly opportune to place the first radiotelescope at the Medicina radioastronomical station in order to ease the acquisition of the required expertise of the IRA personnel in this new venture. Then, following consultations with the EVN colleagues and the evaluation of the geodynamic interest, it was decided that priority should be given to the location in Sicily for the second radiotelescope. Gavril Grueff, then a staff member of IRA, was put in charge of the project. As is well-known the Medicina and Noto VLBI radiotelescopes were inaugurated in 1983 and 1988, respectively.

The idea of a radiotelescope in Sardinia, although with different motivations, was revived in the year 1990. As a result of an occasional meeting with Luciano Guerriero, then President of the Italian Space Agency (ASI), we came to the conclusion that a large radiotelescope in Sardinia would have opened up interesting perspectives both for the development of radioastronomical research in Italy and for ASI's programmes in relation to the Deep Space Network (DSN) and Radio Science experiments. I immediately informed Lucia Padrielli, then acting director of IRA, and Gavril Grueff about this conversation and we all agreed that a large dish, 60 to 70 m in diametre, capable of operating with a reasonable efficiency up to 100 GHz would have represented an excellent opportunity to foster further developments of radioastronomical research in Italy, including a very important addition to the VLBI networks. We were also intrigued by the idea that a large dish, together with the Bologna and Noto radiotelescopes and the 22-m geodynamic antenna of the ASI at Matera, could have realized a mini interferometric network with potentially interesting configuration and baselines. In this brief historical report I will not deal anymore with the science motivations for SRT which has been treated in many specific documents and in several national and international meetings (**?**), and which will be again revisited in the course of the present meeting.

By the end of 1990 ASI invited IRA to submit a proposal for a feasibility study of a major antenna (> 65 m), inclusive of cost evaluation and assessment of the science and space applications taking into account the international scenario. ASI approved IRA's proposal (P.I. Gavril Grueff) in 1992 with a budget of about 230,000 Euro, which also included work to be done by the Arcetri group (CAISMI). A call for bids for the feasibility study of the antenna was issued in 1993 and by the end of the same year a contract was signed with TIW Systems Inc. (Santa Clara, USA), selected from among five firms answering the call. The study was successfully presented by IRA at ASI headquarters in March 1995. The cost of a 64-m diametre fully steerable parabolic antenna, operating up to 100 GHz, was evaluated to be about 36 MEuro (excluding tax).

In the meantime, the IRA, in collaboration with the Observatory of Cagliari, had established contacts with the Sardinian regional government in order to verify its interest and possible involvement to locate the telescope in the Sardinian territory. An extensive campaign to test various possible sites on the island was conducted, finally leading to the present location of the SRT because of the relative lack of electromagnetic disturbances and because of meteorological considerations. (This choice was definitely endorsed by the Sardinia regional government in May 1998.)

The main problem, of course, was to find the necessary financial support. Since 1994 ASI was undergoing major changes in its top level positions; as a result ASI, although maintaining a keen interest in the project, was unable to commit any financial resources. In this respect it should be noted that the Jet Propulsion Laboratory was very supportive of the SRT project in view of the Radio Science experiments to be conducted during the Cassini mission (and the possible involvement of the SRT in other future deep space missions), which saw an important partnership of ASI. (A preliminary planning meeting took place on the occasion of the Symposium on "The

Cassini/Huygens Mission: the Exploration of the Saturn System" held at IRA on Nov. 19-22, 1995). On the other hand the CNR, despite a strong interest in the promotion of the research of one of its main institutes (i.e. IRA), did not have the wish and, I would say, the necessary political vision to get involved in a major long-term project without the assurance that *ad hoc* financial resources would be made available.

Fortunately, the SRT project was kept alive at the level of the Ministry of Universities and Scientific and Technological Research (MURST). The Council for Astronomical Research (CRA), an advisory body to the Minister on astronomy and research done in the astronomical observatories, expressed an overall positive evaluation of the project as a major step forward in Italian radioastronomical research and also indicated the importance of its realization for the development and consolidation of the research done at the Observatory of Cagliari. This was also in line with a political interest of the Ministry to expand the research activities in Sardinia. Based on an official request by IRA-CNR that provided the full documentation, the Ministry started a serious action to see if the SRT project could be financed within the framework of the EU funds for the development of the research in Southern Europe, which included Sardinia. While all this was in progress, the Minister Luigi Berlinguer of the newly established Italian government (following the national elections of spring 1996) decided to implement the application of a law (L.D. 488/92) for the promotion of the research in southern Italy, allocating to this effect a rather considerable budget. It was then agreed that IRA-CNR should resubmit the SRT project to the Minister's office in charge of the implementation of the above law. This was done on July 22, 1996. IRA also applied for support within the same law in order to upgrade the Noto VLBI radiotelescope by making use of newly conceived actuators to control the positioning of each panel of the reflector, so that one could reach a surface accuracy allowing operations at much higher frequency (mm-wavelengths), a technical development of importance also for the SRT.

On September 15, 1997, the Ministry announced the approval of the so called "Radioastronomy Cluster" for a total of about 31 MEuro, a small fraction (about 2%) for the upgrade of the Noto VLBI antenna and the remaining part to fund the SRT. The responsibility for the execution of the SRT project was assigned to the CNR, and consequently to IRA, though recognizing the invested interests and partnerships of ASI and the Region of Sardinia. Obviously, the approved budget was far below what had been requested, much lower than the estimated costs of the feasibility study. However, it was judged that the allocated budget would have been sufficient to cover the construction of the main structure of the SRT, while additional contributions from the partners and other sources would have permitted to bring the project to completion.

By the end of 1997 IRA submitted to the Ministry, as requested, a first detailed executive programme in which one had also identified the key responsible persons (Lucia Padrielli, director of IRA; Gavril Grueff, project manager, and Giancarlo Setti, project scientist). This programme, because of extremely lengthy bureaucratic procedures, was approved by the Ministry only by the end of May 1999. In the mean time the CNR, ASI and the Region of Sardinia had signed a Memorandum of Understanding establishing the main principles and committments of the collaboration (May 28, 1998). Moreover, in order to speed up the execution of the project, in March 1999 ASI assigned to VertexRSI (Santa Clara, USA), a firm incorporating TIW Inc. that had performed the feasibility study (see above), a contract for the production of the executive project under the scientific supervision of Gavril Grueff. The executive project was completed in two years, and presented and made available to ASI in March 2001. In addition, by the end of 1998 the Region of Sardinia started financing, through the Obervatory of Cagliari, the construction of the foundations of the antenna and of the infrastructures (various installments now totaling to about 5.2 MEuro).

Unfortunately the original SRT collaboration was broken when, in the course of an official coordination meeting convened at the ministry on April 8, 2002, the ASI representatives announced the decision of the newly nominated head of ASI, Prof. Sergio Vetrella, to withdraw from the SRT project. No justifications whatsoever were given for a decision which could have seriously undermined the prosecution of the project. Fortunately, the other parties involved, although bitterly complaining against this strange, to say the least, behaviour of ASI, immediately reacted by declaring their even stronger determination to go ahead.

In the autumn of 2002, the CNR launched a call for bids for the construction of the antenna based on the executive project mentioned above. The best offer was made by MAN Technologie AG (Mainz, Germany) and the contract was signed on March 6, 2003. The remaining part of the SRT history concerns the on-going construction phase which will be reported in the course of this meeting.

I cannot conclude without noticing that already 15 years have elapsed since we first started to promote the SRT project, and about 10 years since the completion of the feasibility study. The project could and should have been completed several years ago. It is not the fault of any person or institution in particular, and it is not only a lack of identifiable financial resources and general planning. Lengthy decision-making processes and bureaucratic procedures are to be blamed as well. In a way I feel that the intermediate steps leading to a final decision are lengthier and harder to overcome than the actual realization of a major project, such as the SRT. It is to be hoped that the National Institute for Astrophysics (INAF), that has taken over the role of the CNR, will provide IRA with a smoother and faster operational framework.

References

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