NOTICE OF ALLOCATION OF RESEARCH GRANT

Reference 2017_02_DGE

A competition has been opened to award a research grant in the context of the research and development project "Prospective study of alternative spectrum management scenarios and models"; The grant is funded directly by Autoridade Nacional de Comunicações (ANACOM) under the following conditions:

Academic area:

Electrotechnical engineering (telecommunications and electronics), radiocommunications and spectrum management.

Admission requirements:

The grant is to be awarded to a candidate who holds a Master's Degree in electrotechnical engineering (telecommunications and electronics), obtained from a reputed national or foreign academic institution within the last six years, and who has conducted research into radio systems, especially as regards the design, development and implementation of radio frequency circuits.

Operational proficiency in English and Portuguese is required.

Preferred condition: Preference will be given to candidates who have published relevant articles related to the subject of the research and who demonstrate professional experience in the area.

Objectives and work plan:

The general objective of this research project is the design and conception of electronic radio frequency hardware which, from a solid experimental basis, enables exploration and acquisition of knowledge related to the technologies and interrelations between the various participants in processes associated with the implementation of a Licensed Shared Access (LSA) spectrum-sharing model in the 2.3 GHz - 2.4 GHz band in Portugal. In this context, mechanisms to control and manage envisaged spectrum usage should be studied, by conducting experimental trials on the test platform.

The aim, therefore, is to assess whether, and in what way and to what extent, incumbent systems (Programme Making and Special Events - PMSE) and mobile systems might coexist in the 2.3 GHz - 2.4 GHz band, given their respective idiosyncrasies.

In particular, the work plan involves conducting activities which provide for the following:

a) study of the most recent advances and trends in terms of technological solutions that might be employed in the implementation of an LSA spectrum-sharing model in the 2.3 GHz - 2.4 GHz band;

b) propagation, planning and spectrum engineering studies to determine protection zones, through simulation and analysis of sharing conditions, link budget calculation and coverage forecasting based on statistical models;

c) study and development of interference mitigation techniques and protection zone optimisation, as under an LSA model, in order to allow the relaxation of restrictions and so reduce the complementary exclusion areas;

d) development of hardware solutions (electronic and radio frequency circuits) which automatically enable geolocation and detection of incumbent licensed systems seeking radio spectrum use;

e) integration of the developed technologies with remaining LSA network infrastructure;

f) performance of testing in an environment simulating real conditions, in order to study the feasibility of using existing systems, without interference occurring (or with acceptable levels of interference), within the coverage area of a mobile network operating in the 2.3 GHz - 2.4 GHz band;

g) preparation of a final report with conclusions and recommendations for the implementation of an LSA solution in Portugal.

In the development of the research work, reference should be made to the applicable regulatory framework, in particular the following rules, decisions and recommendations:

a) ECC Decision (14)02, "Harmonised technical and regulatory conditions for the use of the band 2300-2400 MHz for Mobile/Fixed Communications Networks (MFCN)";

b) ECC Recommendation (15)04, "Guidance for the implementation of a sharing framework between MFCN and PMSE within 2300-2400 MHz";

c) ECC Report 205, "Licensed Shared Access (LSA)";

d) ETSI TR 103 113 V1.1.1 (2013-07): Electromagnetic compatibility and Radio Spectrum Matters (ERM); system Reference document (SRDoc); Mobile broadband services in the 2 300 MHz - 2 400 MHz frequency band under Licensed Shared Access regime;

e) ETSI TS 103 154 V1.1.1 (2014-10): Reconfigurable Radio Systems (RRS); System requirements for operation of Mobile Broadband Systems in the 2300 MHz - 2400 MHz band under Licensed Shared Access (LSA);

f) ETSI TS 103 235 V1.1.1 (2015-10): Reconfigurable Radio Systems (RRS); System architecture and high level procedures for operation of Licensed Shared Access (LSA) in the 2300 MHz - 2400 MHz band;

g) 3GPP TR 32.855, System Reference Document on "Study on OAM support for Licensed Shared Access".

Applicable legislation and regulations:

The grant is awarded under Law no. 40/2004 of 18 August (Statute of Scientific Research Grants) as presently worded and under ANACOM's *Regulamento de Concessão de Bolsas de Investigação e Pós-Doutoramento* (Regulation on the Award of Research and Post-Doctorate Grants)[1].

Place of work:

The work will be carried out principally at the facilities and laboratories of Instituto de Telecomunicações (Pólo de Aveiro) and may involve occasional travel to ANACOM (Lisbon).

Duration of the grant:

[1] Available at http://www.anacom.pt/render.jsp?categoryId=380370&languageId=1.

The grant will have a duration of 12 months, commencing in May 2017. The contract governing the grant may be renewed for up to a maximum of two semesters, subject to fulfilment of stipulations as under ANACOM's Regulation on the Award of Research and Post-Doctorate Grants.

Monthly value:

The maximum value of the grant is €980 (nine hundred and eighty euros), in accordance with the table referred to in article 15 of ANACOM's Regulation on the Award of Research and Post-Doctorate Grants (annex I). Payment of the grant will be made on a monthly basis, by bank transfer.

Selection method:

The base selection factor will be the quality of the candidate's curriculum, with a focus on work accomplished within the scope of this competition. Furthermore, the Selection Panel may, at its discretion, require an interview, which will be conducted in person or by videoconference or equivalent means.

The following elements will be valued on a scale from 0 to 100, as follows:

a) curriculum evaluation and suitability of candidate's profile to the work plan - 75%;

b) evaluation of candidate's letter of motivation in accordance with the type of work to be carried out - 25%;

c) should it be considered necessary to conduct an interview, this will have an overall weight of 20%, from the information specified in a) and b) have weights of 60% and 20%, respectively.

Composition of candidate selection panel:

The candidate selection panel will have the following members:

- Prof. Doutor Hélder Ferreira Vasconcelos (Member of ANACOM's Board of Directors);

- Doutor Eng.º José Pedro Mateiro Matias Borrego (Senior Technician, ANACOM);

- Prof. Doutor Nuno Miguel Gonçalves Borges de Carvalho (Professor, Universidade de Aveiro).

The following will act as alternate members on the candidate selection panel:

- Eng.ª Maria Luísa Cordeiro Madeira Mendes (Director of Spectrum Management, ANACOM);
- Eng.º Sérgio de Jesus Pereira Antunes (Principal Consultant, ANACOM);
- Eng.º Miguel Marques Ferreira Capela (Consultant, ANACOM).

Publication/notification of results:

The final results of the evaluation will be announced by means of alphabetically ordered list published on ANACOM's website. The successful candidate will be notified by email.

Application deadline and submission of applications:

The competition is open from **7 – 24 April 2017**.

Applications must include a letter of motivation and the following supporting documents:

a) copy of Candidate's identification document;
b) certificate of academic qualifications with final classification;
c) work plan to be developed;
d) detailed Curriculum vitae;
e) list of publications and copies of most relevant works;
f) contact email address and telephone number.

Applications which do not include all these items will not be considered.

Applications must be delivered and formalized by e-mail to the following address:

bolsas@anacom.pt

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Lisbon, 6 April 2017