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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Title - Sujet Space Technologies Development	
Solicitation No. - N° de l'invitation 9F063-140572/A	**Amendment No. - N° modif.** 006
Client Reference No. - N° de référence du client 9F063-140572	**Date** 2015-04-22
GETS Reference No. - N° de référence de SEAG PW-$MTB-575-13154	
File No. - N° de dossier MTB-4-37358 (575)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-05-06	**Time Zone** **Fuseau horaire** Heure Avancée de l'Est HAE
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PROJECT TITLE: **Space Technologies Development**

The above mentioned Request for Proposal (RFP) is hereby amended to:

1. make changes;
2. answer questions received.

1. For Priority Technology 2 (PT-2) - Light-weight high performance water color imaging spectrometer

On Page A-48, under Section 6 Requirements:

DELETE: [SY-009] Signal-to-noise ratio (minimum)
The minimum SNR of the water color imaging spectrometer shall be better than or equal to 100:1 @ 5% albedo with 100m GSD and 10nm spectral sampling at 700km orbit.

INSERT: [SY-009] Signal-to-noise ratio (minimum)
The minimum SNR of the water color imaging spectrometer shall be better than or equal to 100:1 between 400 nm and 800 nm @ 5% albedo with 100m GSD and 10nm spectral sampling at 700km orbit.

2. For Priority Technology 19 (PT-19) - Multi-Channel SAR Receiver

Question 1: **MCE-002: Is it correct to assume all 20 bandwidths are centered at 5.405 GHz?**
Answer 1: Yes.

Question 2: **MCE-002/MCE/003: As these two specifications together dictate the compression ratio, what is the largest expected compression ratio? In other words, would one expect a combination of 300 MHz bandwidth, and a 50 us pulse duration?**
Answer 2: Yes, a 300 MHz bandwidth and a 50 us pulse duration can be used simultaneously.

Question 3: **MCE-005: Is the noise signal strength considered to be the noise delivered to the Receiver from the T/R modules and associated combiners?**
Answer 3: Yes.

Question 4: **MCE-008: What is the purpose of phase and amplitude pre-distortion? Is this to compensate for inherent distortions in the transmit path (and possibly the receive path)?**
Answer 4: Yes.

Question 5: **MCE-009: A negative noise figure is given. Should this read +12.5 dB?**
Answer 5: Yes

Question 6: **MCE-010: Where in the transmit chain should the transmitted signal be sampled (e.g., DAC input, DAC output, MPA output, etc.)?**
Answer 6: The transmit signal should be rerouted to the receive chain at a point as close as possible to the output of the system.

Question 7: **MCE-012: Regarding the comment provided in the last column, is this comment meant to be applicable only to the last bullet point in the third column?**
Answer 7: It applies to both the second and last as the second may need to have more than one physical channel of the antenna combined within the unit.

Question 8: **MCE-015: Should the Control Interface for the breadboard design conform to a certain bus interface standard?**
Answer 8: There is no specific interface specified.

Question 9: **MCE-016: Under a worse case bandwidth requirement of 300 MHz, and assuming a sampling margin of at least 1.2, a data rate of 720 Msamples/s results. Assuming a minimal 8-bit quantization, this yields a minimal bit rate of 5.76 Gbps per channel. It is recognized that the given rate is qualified by the statement "when all for channels is used." Does this mean 800 Mbps per channel, or the combined data rate? In either case however, the specification seems insufficient. Could you please add some clarity around this specification? Does this specification perhaps assume data compression of some sort, or a de-chirping of the signal?**
Answer 9: The minimum data rate specified is for all channels simultaneously. Standard Block Adaptative Quantification compression can be assumed to reduce the data rate although its implementation is not required in the SoW. Also please refer to question 10 answers which explain the difference between the output rate and the acquisition of data. It is expected that some limitation may be present if the minimum data rate is implemented on the selection of bandwidth, number of channels and receive duty cycle.

Question 10: **MCE-016: For what duration should these data rates be sustained and how often?**
Answer 10: The data rate of the interface is continuous. The acquisition of the data will be made in a pulsed mode with a PRF between 1 kHz and 7 kHz and a maximum duty cycle of about 50% for the 300 MHz bandwidth.

Question 11: **MCE-016: Should the Digital Output Interface for the breadboard design conform to a certain bus interface standard?**
Answer 11: There is no specific interface specified.

Question 12: **MCE-017/018/019/020: Could you please add some clarity to the statement in the third column?**

Answer 12: The SoW intentionally does not provide specific values for these items at this point in time because the exact values are not yet defined. Phase and Amplitude characteristics should be considered in the design but there is no requirement for a specific level of performance for this early prototype. As very rough guideline, the amplitude flatness is expected to be controlled within about 0.5 dB and the phase within about 3 degree of a nominal chirp phase. The amplitude and phase stability are expected to be within the same order of magnitude. Larger systematic phase error (quadratic) can be tolerated but are not expected to exceed about 20° at the edge of the band. However, these values are for guidance only and are not enforced as a formal requirement.

Question 13: **MCE-027: Similar clarification as needed for MCE-016.**
Answer 13: Same answer as MCE-016.

Question 14: **Could you provide further information on the constraints of the support structure for the transceiver in the intended or typical end-platform, such as:**

- **i. Power supply constraints (voltages, currents, noise specification, etc.)**
- **ii. Physical size constraints**
- **iii. Mass constraints**
- **iv. Thermal constraints**
- **v. Environmental constraints**
- **vi. I/O interfaces**
- **vii. Physical and electrical connectivity**

Answer 14: No. This information is not yet available as this is for the design of an early breadboard. The breadboard should operate under typical lab conditions. MCE-024 and MCE-025 provide some limited information on the expected Mass and Power of the final system.

Question 15: **Should this multi-channel bread-board design target a specific SAR system architecture (Radarsat-2, RCM, etc.)?**
Answer 15: There is no requirement about this item.

ALL OTHER TERMS AND CONDITIONS OF THE RFP REMAIN UNCHANGED.