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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

Document contient des exigences relatives à la sécurité

Vendor/Firm Name and Address

Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution

Travaux publics et Services gouvernementaux Canada
Place Bonaventure, portail Sud-Oue
800, rue de La Gauchetière Ouest
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Montréal
Québec
H5A 1L6

Title - Sujet Development of photon counting spec	
Solicitation No. - N° de l'invitation W7701-217344/A	Amendment No. - N° modif. 002
Client Reference No. - N° de référence du client W7701-217344	Date 2022-06-28
GETS Reference No. - N° de référence de SEAG PW-SMTB-255-16470	
File No. - N° de dossier QCL-0-43177 (255)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM Eastern Daylight Saving Time EDT on - le 2022-08-26 Heure Avancée de l'Est HAE	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Desforges, Julie	Buyer Id - Id de l'acheteur mtb255
Telephone No. - N° de téléphone (514) 602-8307 ()	FAX No. - N° de FAX () -
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction:	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

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W7701-217344/A

N° de la modif - Amd. No.
002

Id de l'acheteur - Buyer ID
MTB255

N° de réf. du client - Client Ref. No.
W7701-217344

File No. - N° du dossier
QCL-0-43177

N° CCC / CCC No./ N° VME - FMS

AMENDMENT 002

The purpose of amendment 002 is to provide answers to the questions raised by the industry during the request for proposal period and postpone the closing date.

Closing date of the Request for proposal has been postponed until August 26, 2022, 2:00pm.

Question 1 :

We would like to officially request more time to reply, later in September.

Answer 1:

The request for an extension of bid closing date is accepted to August 26 2022.

Question 2:

Do the subcontractors need to be Canadian? Especially the foundry.

Answer 2 :

Please refer to clause A3050T Canadian Content Definition

<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual/5/A/A3050T/5>

Question 3

Do we consider the fab as a sub-contractor or a supplier?

Answer 3:

Answer to come.

Question 4:

How do you define the dynamic range (45dB)? Is your dB the optical dB ($10\log_{10}(P/P_0)$)? Is it per bin? If so which one (1m or 10m)? Is it from the dark counts to 45dB? (example, 100kHz dark count rate à 0.00067 photons per 6.7ns equivalent; 45dB à 0.00067 to ~22 photons)

Answer 4:

These are optical dB. The detector shall be able to detect after linearization over a sampling interval 15000MHz in terms of photons per channel. If a sampling interval is 10m then it means 1000 photons per channel after linearization. (**Assumption** : An array of detector being 256 X 256 detectors. If 32 channels we have 256 X 8 detectors so 2048 detectors per channel. If a uniform illumination is assumed it means that on the sampling interval approximately 675 detectors will have been triggered.)

Question 5:

For the maximum number de counts per channel, you have 15000 (as the maximum, with no minimum), but then a unit in MHz. It would be as if you were requiring 15 000 000 000 counts per second (15 Gcounts/s) per channel as an absolute goal. Is this the requirement? 150 detected photons in a 10ns time bin?

Answer 5:

The counts number after linearization. See the response to question 4 above which is similar.

Question 6:

For the quantum efficiency, is it the quantum efficiency of the sensitive part, or the overall photon detection efficiency (PDE), the product of quantum efficiency of the silicon, avalanche probability and fill factor? Or a subset of these?

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Answer 6:

This is the quantum efficiency of the sensitive part which is not necessarily silicon. The most mature technologies are however made with silicon. It is possible to add microlenses to increase PDE. It is also possible to use back illumination technology. The best possible PDE is to be achieved.

Question 7:

For the minimum and maximum in quantum efficiency, is the minimum of 20% the QE for the worst wavelength and 95% the QE for the peak wavelength? Or is that anything between 20% and 95% at peak is acceptable?

Answer 7:

All the values between 20% and 95% are acceptable. However, the minimum quantum efficiency shall be above 20% all parameter considered. See answer to question 5 above which provide a complement of information.

Question 8:

For the effective range: do we interpret the requirement as the measurement being done between 50m and 5000m from the lidar in contiguous (single laser pulse) time/distance bins? Or can it be done using multiple laser pulses varying the delay between laser and lidar return measurement? Or do we interpret this as a need for a programmable range, the range being programmable from between 0 and 50m all the way to between 0 and 5000m?

Answer 8:

The range is assumed for a single pulse. For all the pulses it must be possible to get samples at each 10m at most. This means that at least 500 samples per pulses for all pulses over 5000m

Question 9:

Sensitivity: Is this the dark counts? The definition given in the RFP seems to be that of the noise of a measurement and not that of the smallest measurable signal.

Answer 9:

The dark counts can vary depending on the selected technology and the biasing of the detectors. The sensitivity is referred to the maximum dark counts of the RFP.

All other terms, clauses and conditions remain unchanged