

MIRI European Consortium	JWST MIRI	Ref: MIRI-TN-00072-ATC Issue: 3 Date: 27 th Aug 2015
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James Webb Space Telescope (JWST)

Mid-Infrared Instrument (MIRI)

Photon Conversion Efficiencies

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Approved by:	Date:

Change Log

Issue		Date
1	First issue	13/11/14
2	Minor changes to ImPCE.xls (Issue 2) to fix column labels.	29/5/15
3	Clarification of intended usage (p4)	27/8/15

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References

Reference ID	Document ID	Title	Issue	Date
RD-1	MIRI-TN-00061	Sensitivity Modelling of the MIRI Flight Model	3	Dec 13
RD-2	Glasse et al. PASP, 2014	Mid-Infrared Instrument for the James Webb Space Telescope IX: Predicted Sensitivity	-	Aug 15

1 Introduction

This technical note acts as a wrapper for the control and delivery of the Photon Conversion Efficiency values used in the MIRI sensitivity model [RD-1] and whose results are published in [RD-2]. The PCE is equal to the number of electrons detected per photon incident on the MIRI entrance focal plane within the nominal science beam. The tables are intended to be used on an input photon flux at the MIRI entrance focal plane (ie they exclude the telescope optics). They include detector QE curves (Ressler, private communication), as well as mirror reflectivities (0.98 per surface), and a wavelength independent transmission factor of 0.8 to represent the Beginning of Life (BOL) contamination. (The End Of Life contamination is not included). The filter profiles have been clipped in wavelength to remove measurement artefacts.

Note that the nominal transmission of the JWST OTE, which is assumed to be 0.88 at start of mission in RD-2, is not included in these PCEs.

The PCEs are provided in three Excel spreadsheet '.xlsx' formatted files as detailed below. For convenience and version control we provide plots of the data in the following section. We may update future issues of this note to discuss the origin of the provided PCE values, but the reader is referred to RD-2 in the first instance.

2 PCE Plots

2.1 Imager

Data file ImPCE_TN-00072-ATC-Iss2.xlsx.

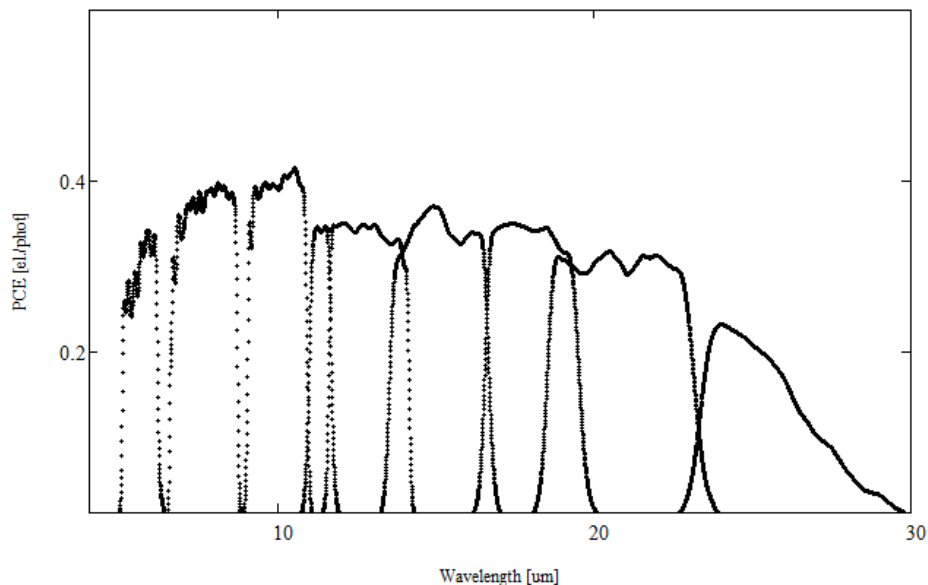


Figure 1 Plot of Imager PCE data points.

2.2 Low Resolution Spectrometer

Data file LRSPCE_TN-00072-ATC-Iss1.csv.

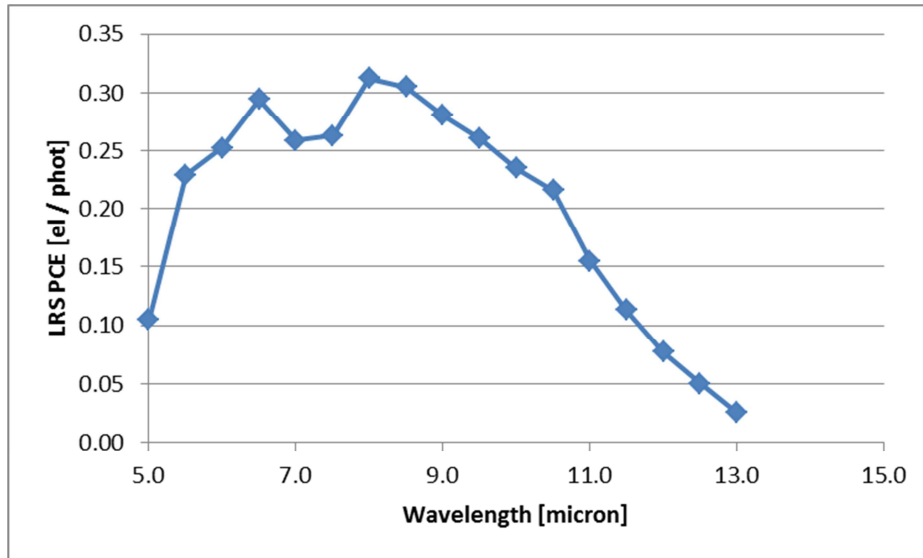


Figure 2 Plot of LRS PCE data points.

2.3 Medium Resolution Spectrometer

Data file MRSPCE_TN-00072-ATC-Iss1.xls. Note that the PCEs are ordered by MRS sub-band ID, where sub-band 1A has an ID of 0, 1B = 1, 1C = 2, 2A = 3 etc.

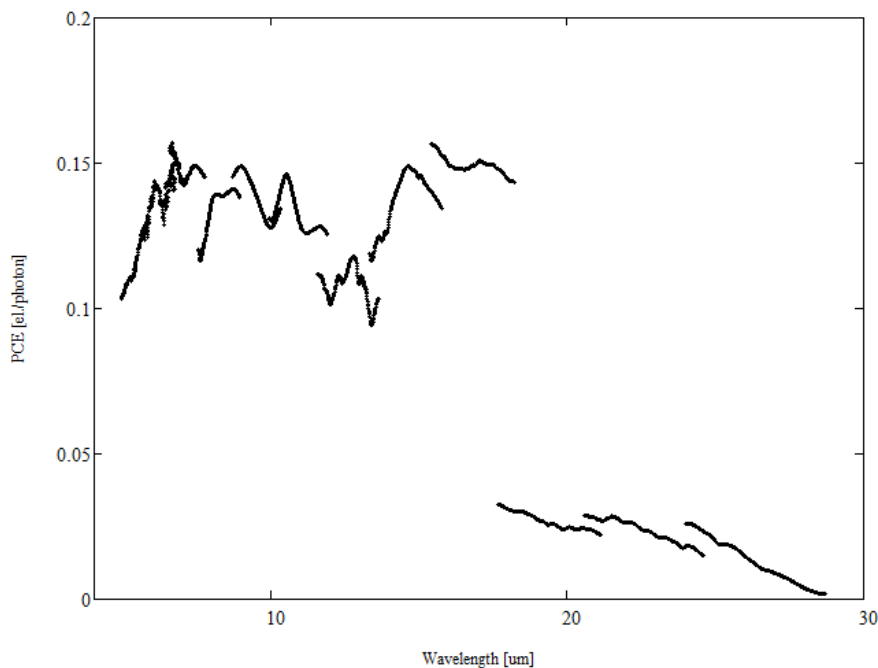


Figure 3 Plot of MRS PCE data points.

A Glasse, 27/8/15