

CEOS-WGCV-IVOS Vocabulary and Training – Update

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Working group on vocabulary

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Clear goal

1. A dictionary: all (“correct enough”) definitions in use for different words, collated in one place
2. Tutorial materials to help give the message of CalVal out to the broader community
 - How to do uncertainty (preflight/onboard cal, vicarious cal/val, level 2a?)
 - How to think about traceability to SI or other references
 - How to consider comparisons (averaging different calibrations / comparisons)

Accessibility	fiducial reference measurements (FRM)	precision	service
Accuracy (of measurement)	field-of-regard	procedure	stability
area (volume) of representativeness	field-of-view	Procedure (of measurement)	standard uncertainty
Availability	footprint	process	Standardisation
bias	geometrical resolution	process validation	structured error
bias correction	ground sampling distance (GSD)	product	system
calibration	Harmonisation	Protocol	systematic error
(sensor) (inter) / (re) calibration	Homogenisation	quality	traceability
climate data record (CDR)	in situ measurement	quality assessment	traceability chain
(measurement) covariance matrix	indication	quality assurance	Type A evaluation of uncertainty
Data fusion	influence quantity	quality control (QC)	Type B evaluation of uncertainty
dead band (or neutral zone)	instantaneous field of view (IFOV)	quality indicator (QI)	uncertainty
detection limit	instrumental drift	radiometric calibration	uncertainty of measurement method
essential climate variable (ECV)	interoperability	random error	validation
EO data products (L0, L1, L2, L3, L4)	measurand	relative standard uncertainty	verification
error	metadata	repeatability	vicarious calibration
establish	Methodology	representativeness	
FCDR (Fundamental Climate Data Record)	monitoring	reproducibility	
fiducial	point-to-area (point-to-volume) representativeness	resolution	
fiducial mark	positional accuracy	sensitivity of a measuring system	

<p>Accuracy (of measurement)</p>	<p>Closeness of agreement between a measured quantity value and a true quantity value of a measurand.</p> <p>NOTE 1 The concept ‘measurement accuracy’ is not a quantity and is not given a numerical quantity value. A measurement is said to be more accurate when it offers a smaller measurement error.</p> <p>NOTE 2 The term “measurement accuracy” should not be used for measurement trueness and the term “measurement precision” should not be used for ‘measurement accuracy’, which, however, is related to both these concepts.</p> <p>NOTE 3 ‘Measurement accuracy’ is sometimes understood as closeness of agreement between measured quantity values that are being attributed to the measurand.</p>
<p>Accuracy (Atmospheric Correction Community)</p>	<p>[Community, not standard definition]</p> <p>Used in the atmospheric correction community to represent the average difference between the modelled and measured quantities</p>

Definitions of “resolution”

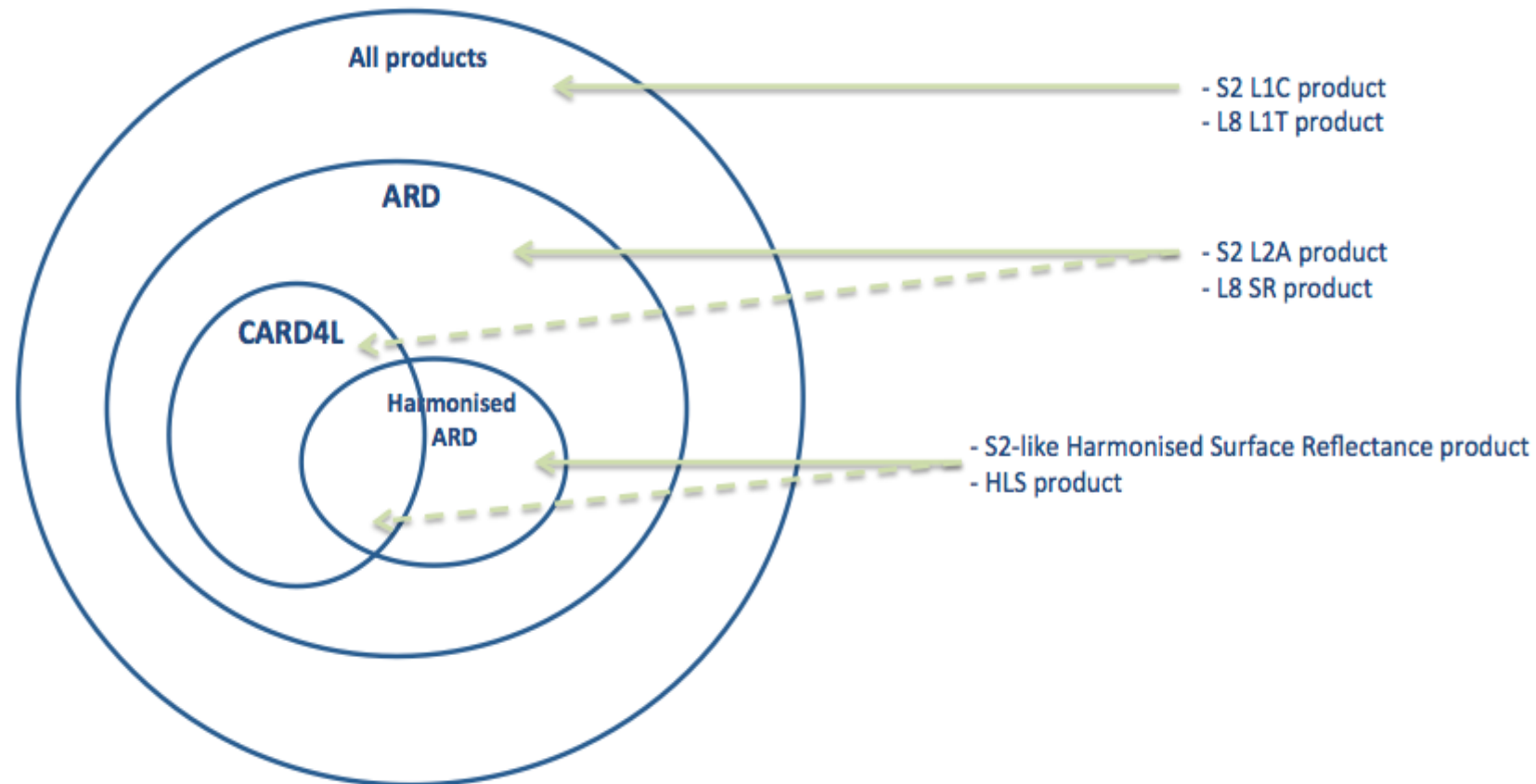
- (1) smallest change in a quantity being measured that causes a perceptible change in the corresponding indication (VIM)
- (2) the least angular/linear/temporal/spectral distance between two identical point sources of radiation that can be distinguished according to a given criterion (NIST)
- (3) the least vertical/geographical/temporal distance between two identical atmospheric features that can be distinguished in a gridded numerical product or in time series of measurements; resolution is equal to or coarser than vertical/geographical/temporal sampling of the grid or the measurement time series (MACC)

INTEROPERABILITY

Interoperability – originally provided definition

capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units

USGS/NASA-ESA Working Group on Landsat/Sentinel-2 ARD products



“Harmonised
Surface
Reflectance”

USGS/NASA-ESA Working Group on Landsat/Sentinel-2 ARD products

- **Interoperable products**

In order for products to be considered as “Interoperable products” they must contain a minimum set of metadata describing their geographical and temporal acquisition characteristics and their sensor characteristics. The minimum required for interoperable products is that their metadata provide sufficient information to enable products generated by different sensors to be ingested into common tools. This implies that the geographical and sensor characteristics in the product’s metadata allow products from different sensors to be superimposed, compared and generally worked with in a common environment.

USGS/NASA-ESA Working Group on Landsat/Sentinel-2 ARD products

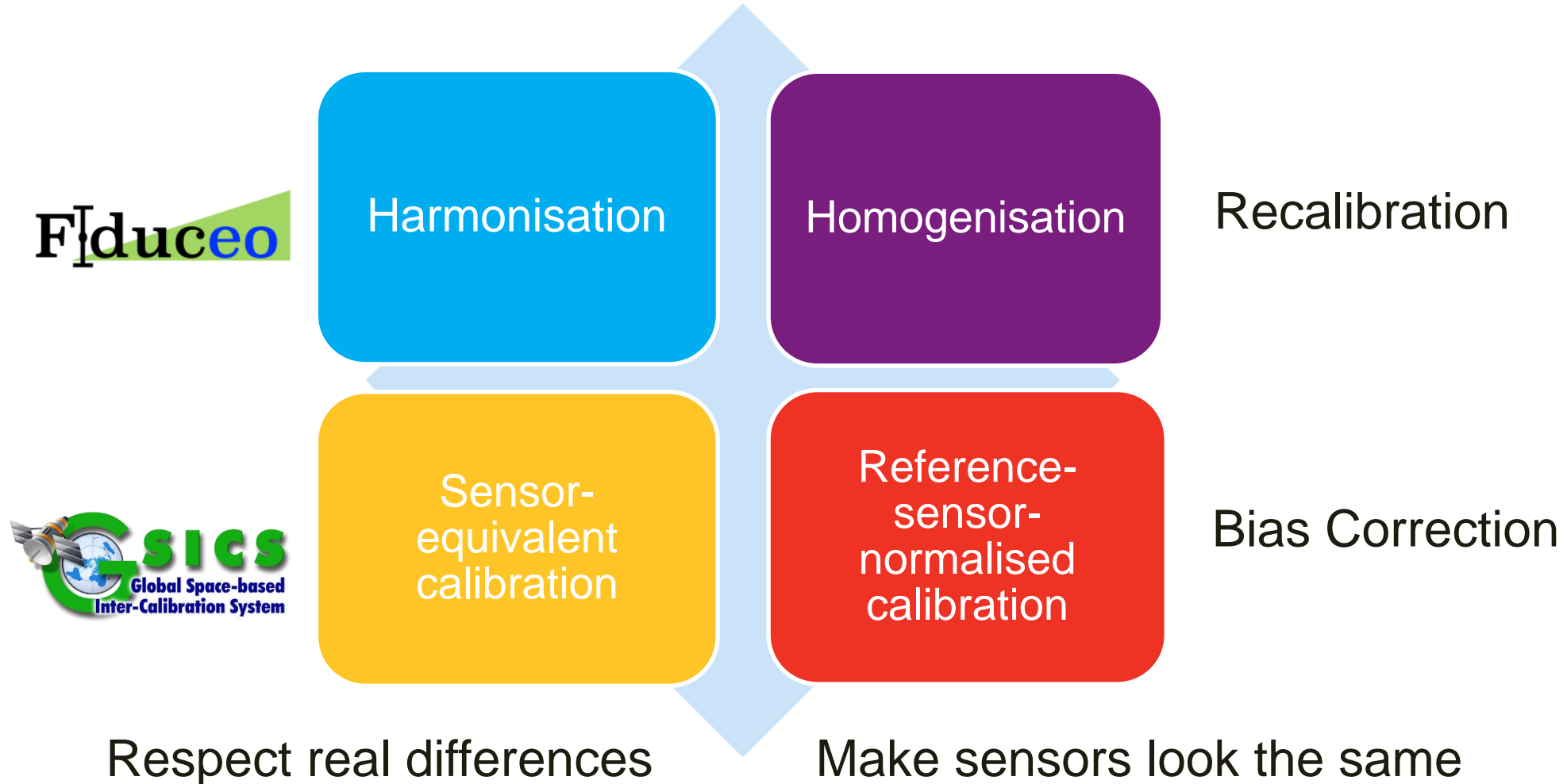
- **Harmonised products**

Harmonised products are a specific type of interoperable products combining data from different sources that are processed to provide a single time-series stack of information layers. Each layer of this time series stack can be used indifferently, that is without reference to the sensor with which it was acquired.

For optical imaging sensors, harmonised surface reflectance ARD products share a common atmospheric correction, a common geometry, and a common set of radiometric adjustments for compensating Bidirectional Reflectance Distribution Function (BRDF) and band-pass effects.

Harmonised surface reflectance ARD products will only contain those spectral bands that are common to both sensors.

FIDUCEO terms



How do we define “Interoperability” or “interoperable”?

- Data formats / “origin-agnostic processing”?
- With uncertainties? Requiring comparison? Peer review?
- With differences accounted for through “harmonisation”?
 - Including “bias correction” or as re-calibration?
 - Made to look equivalent (change SRF) or keeping SRF differences?

My first go on “interoperability”

ability to combine data from different sensors in processing and analysis because differences between sensors are understood and quantified and sensor data comes with rigorous uncertainty analysis and all necessary metadata

Next steps

- Get vocabulary up on new portal as that is introduced
 - Requires review of vocabulary by committee by 19 April
 - Suggestions for new words?