Elements Already Present In Core *ObsCore* [1]

Element	HEA-specific issue?	Description	Suggested Recommendation
o_ucd/o_unit/ o_calib_status/ o_stat_error	Yes?	Most HEA event lists have multiple observables; these quantities should support multiple observables; setting *o_ucd* = NULL for event lists as recommended is obscuring and does not facilitate data discovery	Modify these elements to support meaningful representation of DPs that include multiple observables
s_fov/s_resolution/ em_resolution	Maybe	These properties may be (strongly) dependent on particle energy, location within the FoV, … (*e.g., Chandra* spatial resolution varies by a factor 50× across the FoV)	Consider how to represent properties that are strongly dependent on other quantities and how to enable meaningful data discovery for these cases
calib_level	No?	Many HEA event lists fall between *calib_level*s 1 and 2 (spatial and temporal axes are calibrated physical quantities, but spectral axis is instrumental and requires application of responses); this is not always the case so it is beneficial to be able to differentiate "1.5" and 2	Consider how to capture the calibration level of DPs that have the instrument signature partially removed (*e.g.,* only for some axes)
dataproduct_type	No	Limited set of *dataproduct_type*s don't represent some common types of HEA or Advanced DPs; limitation on use of "*measurements*" means that value can't be used for most ADPs; lack of a broad set of *dataproduct_type*s limits ability to perform meaningful data discovery	Add a wider set of *dataproduct_type*s in consultation with the multi-waveband community; remove caveat on use of *measurements*

Elements Already Present In Core *ObsCore* [2]

Element	HEA-specific issue?	Description	Suggested Recommendation
t_min/t_max	No	Not useful for ADPs that combine multiple observations; see also *t_gti* under *Additional Elements*	Modify these elements to support multiple disjoint time intervals
proposal_id	No	Single valued *proposal_id* may not work for ADPs that combine multiple observations	Modify *proposal_id* to allow multiple-values similar to other provenance properties (*facility_name, instrument_name*)

Additional Elements

Element	HEA-specific issue?	Description	Suggested Recommendation
ev_number	Yes	Number of events in an event list is a useful HEA dimensionality for data discovery	Add as HEA extension
energy_min/ energy_max	Yes	*em_min/em_max* in units of *m* do not work well for HEA, where the natural units are energy (*i.e.*, inverse wavelength); there are additional usability concerns for VHEA that may make *em_min/em_max* unusable	Consider adding *energy_min/ energy_max* as HEA extension
t_gti	Yes?	*t_min/t_max* do not allow representation of multiple GTIs/STIs so queries on time may not be accurate	Consider solving as part of support for multi-valued *t_min/t_max* rather than adding a separate HEA-specific concept
irf_type/ irf_description etc.	No	HEA event list data products typically require associated DPs such as instrument response functions (*e.g.*, IRF, RMF, ARF) for analysis; HOWEVER, identification of associated DPs required to enable meaningful further analysis NOT a HEA-specific issue	Add (multi-valued) *assocproduct_type, assocproduct_description etc.* to core
access_format	No	Additional *access_format* MIME-types may be needed to support standardized HEA formats	Identify and request addition of appropriate MIME-types
*UCD*s	No	Additional *UCD*s may be needed to support some HEA observables; (*e.g.*, no UCD is defined for PHA)	Identify and request addition of appropriate UCDs