

# Small bodies sub-types

• SsODNet & the Quareo web service use "Types" of objects which are all included in EPN-TAP list:

"Asteroid","Spacecraft","Comet","Exoplanet","Spacejunk","Satellite","Planet","Dwarf Planet","Star"

as well as "Classes" which are sub-divisions of some types (and other classes, up to 3 levels):

• SsODNet uses "Classes" of objets: ["MB", "Middle", "Inner", "Outer", "NEA", "Mars-Crosser", "Apollo", "Hungaria", "Trojan", "Amor", "Hilda", "Cybele", "KBO", "Resonant", "Aten", "Short-period", "Classical", "Main", "Centaur", "SDO", "Halley-type", "3:2", "Jupiter-family", "7:4", "9:5", "5:3", "Detached", "11:6", "2:1", "Long-period", "5:2", "4:3", "7:3", "19:9", "Atira", "3:1", "11:8", "5:4", "12:5", "9:4", "8:3", "11:3", "7:2", "11:2", "11:3", "27:4"]

This is a composite and multi-level parameter, each object may have several values attached.

(other values are related to spacecraft and spacejunk, see here: [http://vo.imcce.fr/webservices/ssodnet/quaero#types\\_and\\_classes](http://vo.imcce.fr/webservices/ssodnet/quaero#types_and_classes))

Satellites of asteroids are tagged as satellites with *parent* = primary, and have no "class"

No interstellar object included in 2020.

**EPN-TAP services** use *target\_class* (compulsory), *dynamical\_class* and *dynamical\_type* (optionals)

• Target\_class related to small bodies are:

asteroid, dwarf\_planet, comet

• Recurring pb with dwarf\_planet, not always identified as such in databases / services

Baptiste proposes to always set them to "dwarf planets#asteroid" in target\_class — **May solve all pb, check if this is consistent!**

• 2 other parameters reserved: *dynamical\_class* and *dynamical\_type* (should be a subdivision, TBC). Should both provide a clear list of values, based on those of existing services.

What is ~ clear (names TBC):

*dynamical\_class*: MBA, NEO, TNO, Trojan, Centaur, JFC (or Jupiter-family), Halley-type, Long-period...

*dynamical\_type*: families, resonances... + Plutino (=res 2:3)?, Hot classical, Cold classical, Scattered Disk object, Detached object...

Target_class	dynamical_class	dynamical_type
comet	JFC (or Jupiter-family)	
	Halley-type	
	Long-period	
	Interstellar?	
asteroid	NEO	Athen
		Apollo
		Amor
		Atira
	MBA	families (Hungaria, Phocaea, Hilda, Cybele...) Mars-crosser?
Trojan	associate primary?	
Centaur		

	TNO	<i>resonances, or Resonant</i> Plutino (= res 2:3)? Hot classical Cold classical Scattered Disk object Detached object
dwarf_planet#asteroid	MBA TNO	

• **TNOsarecool** uses dynamical\_type , including res 2:5, res 1:2, Plutino, Hot classical, Cold classical, SDO (Scattered disk object), Detached object, Inner Oort obj (not strictly KBO?)

• **M4ast** uses no dynamic classification

• **MPC** uses orbit\_class !!! Those are free comment strings and are not always informed (can't be used easily for searches...)

Include 4 NEO types + Object with perihelion distance < 1.665 AU, Hungaria, MBA, Phocaea, Hilda, Jupiter Trojan, Distant Object, Unclassified

=> Is there a clear IAU nomenclature with 2 sub levels?

• **Basecom** uses comettype with values: dynamically new, Halley-type comet, Jupiter-family comet, long-period comet

• **DynAstVO**

Uses dynamical\_class: MBA, NEO and Null + add Centaur?

Also uses dynamical\_type including Athen Apollo Amor Atira, plus other things:

CENTAUR (class NULL) - should be in dynamical\_class

PHOCAEA (class NULL) - an MBA family (dynamical\_class should be MBA)

I, IIA, IIB ( class MBA)

• **LuckyStar** table (web site in Brasil):

Contains asteroids and satellites data.

Uses a composite DynClass parameter with values: Centaur, (Planet Satellite), TNO> Cold C., TNO> Detached O., TNO> Hot C., TNO> Plutino, TNO> Resonant, TNO> Scattered D.O., Trojan (- in line with TNOsarecool)  
For asteroid satellites, this refers to the primary.

SSODnet class:	target_class (EPN-TAP)	dynamical_class (DynAstVO)	dynamical_type (TNOsarecool, DynAstVO)	DynClass (LuckyStar)	Orbit_class (MPC)
----------------	---------------------------	-------------------------------	---	-------------------------	----------------------

"MB"	Asteroid	MBA			
"Middle"	Asteroid	MBA			
"Inner" (either MB or Classical)	Asteroid	MBA or TNO	Inner?		
"Outer" (either MB or Classical)	Asteroid	MBA or TNO	External?		
"NEA"	Asteroid	NEO			
"Mars-Crosser"	Asteroid	?			
"Apollo"	Asteroid	NEO	APOLLO		
"Hungaria"	Asteroid	MBA	Hungaria		
"Trojan"	Asteroid	Trojan		Trojan	
"Amor"	Asteroid	NEO	AMOR		
"Hilda"	Asteroid	MBA	Hilda		
"Cybele"	Asteroid	MBA	Cybele		
"KBO"	Asteroid	TNO			
"Resonant"	Asteroid	TNO		TNO> Resonant	
"Aten"	Asteroid	NEO	ATEN		
"Short-period"	Comet				
"Classical"	Asteroid	TNO	Hot classical & Cold classical?	TNO> Cold C. & TNO> Hot C.?	
"Main"	Asteroid	TNO	Hot classical & Cold classical?	TNO> Cold C. & TNO> Hot C.?	
"Centaur"	Asteroid	Centaur		Centaur	
"SDO"	Asteroid	TNO	SDO	TNO> Scattered D.O.	
"Halley-type"	Comet				
"3:2"	Asteroid	TNO	Plutino	TNO> Plutino	
"Jupiter-family"	Comet	JFC			
"7:4"	Asteroid	TNO			
"9:5"	Asteroid	TNO			
"5:3"	Asteroid	TNO			
"Detached"	Asteroid	TNO	Detached object	TNO> Detached O.	
"11:6"	Asteroid	TNO			
"2:1"	Asteroid	TNO	res 1:2		
"Long-period"	Comet				
"5:2"	Asteroid	TNO	res 2:5		
"4:3"	Asteroid	TNO			
"7:3"	Asteroid	TNO			
"19:9"	Asteroid	TNO			
"Atira"	Asteroid	NEO	ATIRA		
"3:1"	Asteroid	TNO			
"11:8"	Asteroid	TNO			
"5:4"	Asteroid	TNO			
"12:5"	Asteroid	TNO			
"9:4"	Asteroid	TNO			
"8:3"	Asteroid	TNO			
"11:3"	Asteroid	TNO			
"7:2"	Asteroid	TNO			
(type: Dwarf Planet, various classes)	Dwarf_planet	MBA or TNO			
Not identified in SSODnet	Comet		Inner Oort obj		
(a family; MB / Inner)	Asteroid	MBA	Phocaea		
	Asteroid	MBA	I, IIA, IIB		
No distinction between hot and cold classical objects					

