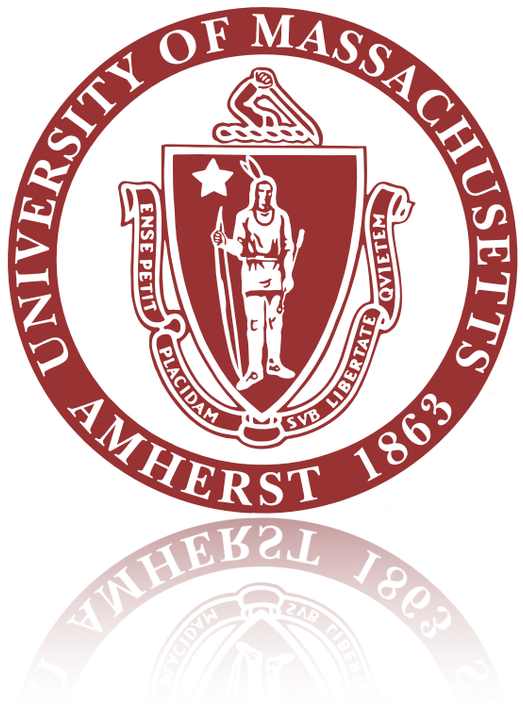


Web 3D

Edward Moyse

TADA

- TADA is the ATLAS Fast Physics Monitoring System
- TADA has some very simple information about an event, extracted from the tag file
  - Quantities, such as eta/phi of tracks, jets MET, and pT/ET etc
    - Can see at bottom of page: '**SELECTED EVENTS**' and then '**Details**' column
- So, spent some time trying incorporate a proof of concept into TADA
- Now live. For instance, go to:
  - https://atlas.web.cern.ch/Atlas/fastphys/tagmon/exo_multijet.html
  - Scroll to bottom and select 'Display'

SELECTED EVENTS

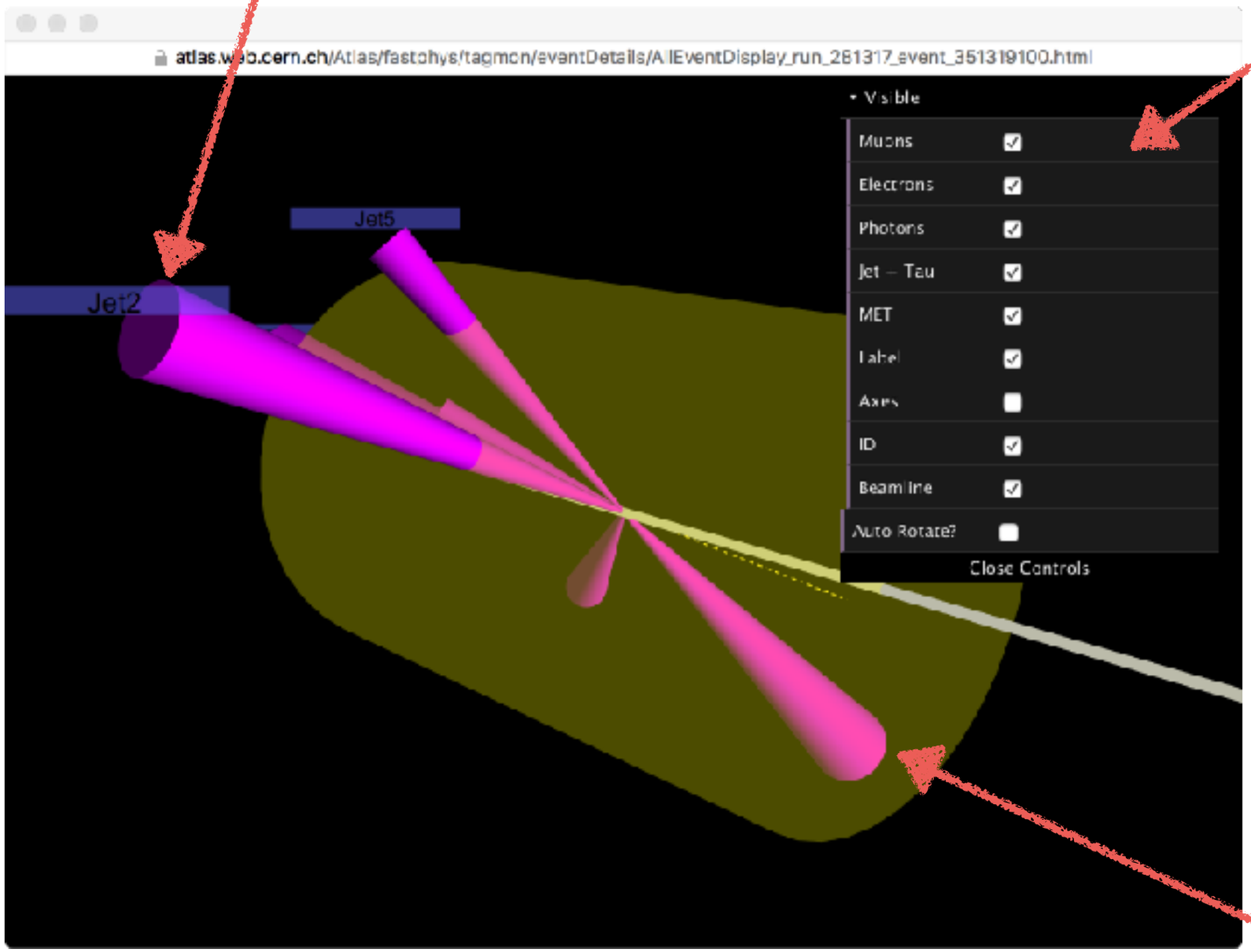
6 jets (tail)

RunNumber	EventNumber	LumiBlockN	NJet	JetPt5	JetPt6	Details	Display	TAG file
279169	1156465504	851	6	412723	178746	click	click	click
279932	987274395	706	6	401056	177351	click	click	click
279984	1079767163	672	6	420585	268664	click	click	click
280231	39964989	151	6	439350	126322	click	click	click
280231	113898628	184	6	420087	81391.4	click	click	click
280520	84518052	240	6	443761	51657.2	click	click	click
280862	683322481	301	6	400898	118825	click	click	click
280950	1353852600	521	6	433061	129448	click	click	click
281317	351319100	217	6	407030	176453	click	click	click
284213	2457796736	719	6	447879	81887.3	click	click	click
284285	3804162492	1219	6	409183	235544	click	click	click

Objects can be labelled

Simple menu

Allow user to switch off and on quantities, Enable/disable auto-rotate feature



Controls

Mouse wheel - zoom in/out
Click and drag - rotates
Right-click and drag - pan
'H' - hides menu

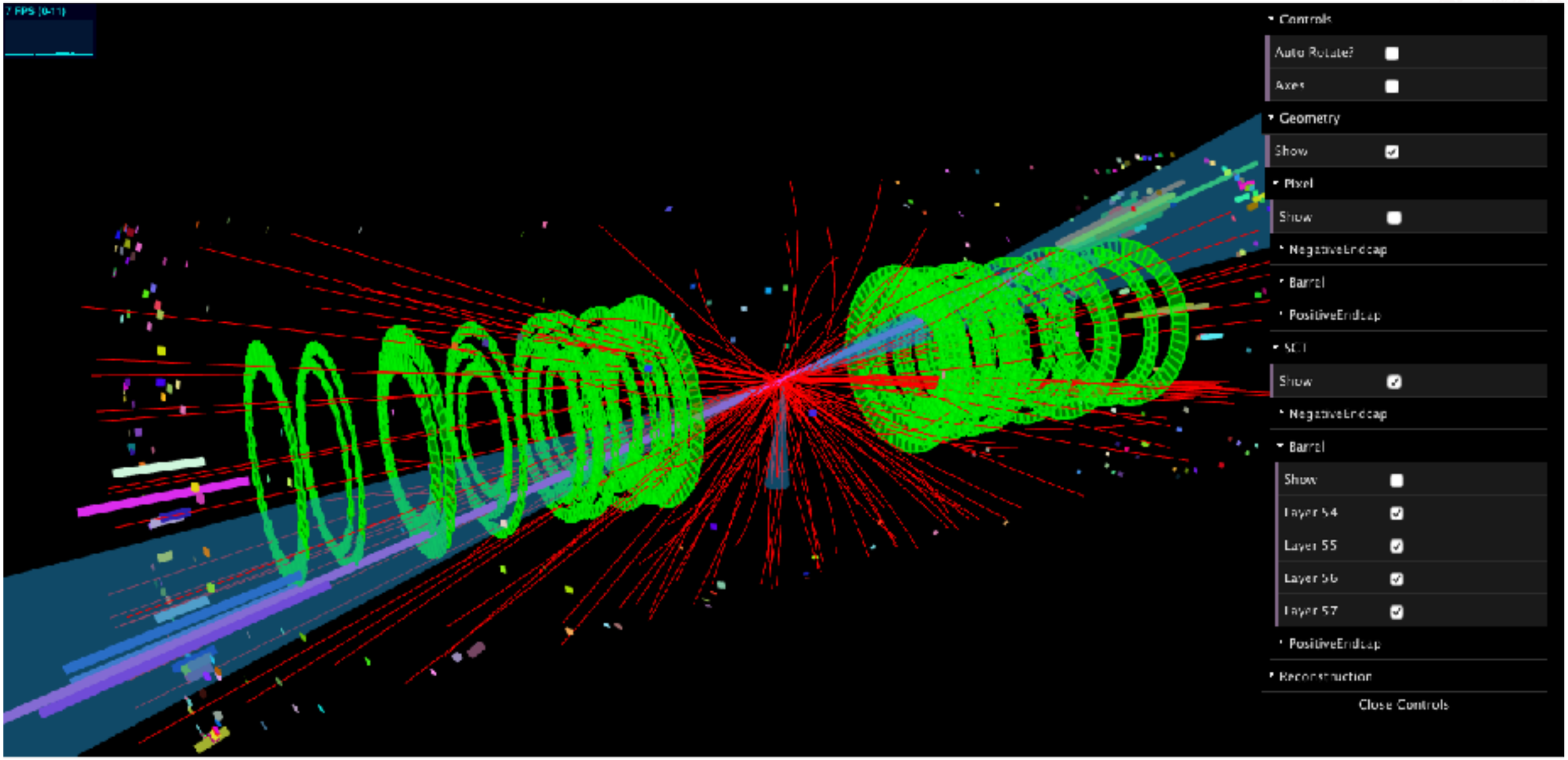
Simple representations of objects

KISS
ID volume shown, to give scale

Visualising more complex data

- Want to keep this as detector agnostic as possible
- Format is same JSON we sent to Ilija for initial use in ATLASrift
  - Basically:
    - “OBJECTTYPE" : {“COLLECTION_NAME":{"OBJ 0”:{ … } } } etc
    - e.g. ”TrackParticle” : {"InDetTrackParticles":{"Trk 0”:{ … } } }
    - To see it all, have a look at ‘http://emoyse.web.cern.ch/emoyse/WebEventDisplay/EventDump.json' (Can enter this URL into JSONlint.com and validate it to see it formatted nicely).
- Currently we have:
  - Track(particles)
  - Jets
  - MET
  - Cells (hardcoded to be displayed at the ATLAS calo boundaries at the moment)

Visualising more complex data



https://emoyse.web.cern.ch/emoyse/WebEventDisplay/jsdisplay.html

(might need to disable geometry on slower machines)

Technologies and problems

- Resources used:
  - Three.js - fantastic javascript webgl library
  - dat.gui - used for menus
- Data input:
  - TADA - ATLAS dedicated format feeds into JSON and then to webpage template
  - WebEventDisplay - separate JSON formats for geometry and event data
- Problems:
  - for TADA - nothing really. It has simple needs.
  - WebEventDisplay
    - some limitations with transparency in three.js
    - performance can get a bit slow (but still pretty impressive for a browser, and optimisations to do)
    - biggest issue is GUI - dat.gui is a bit limited if we want to do more