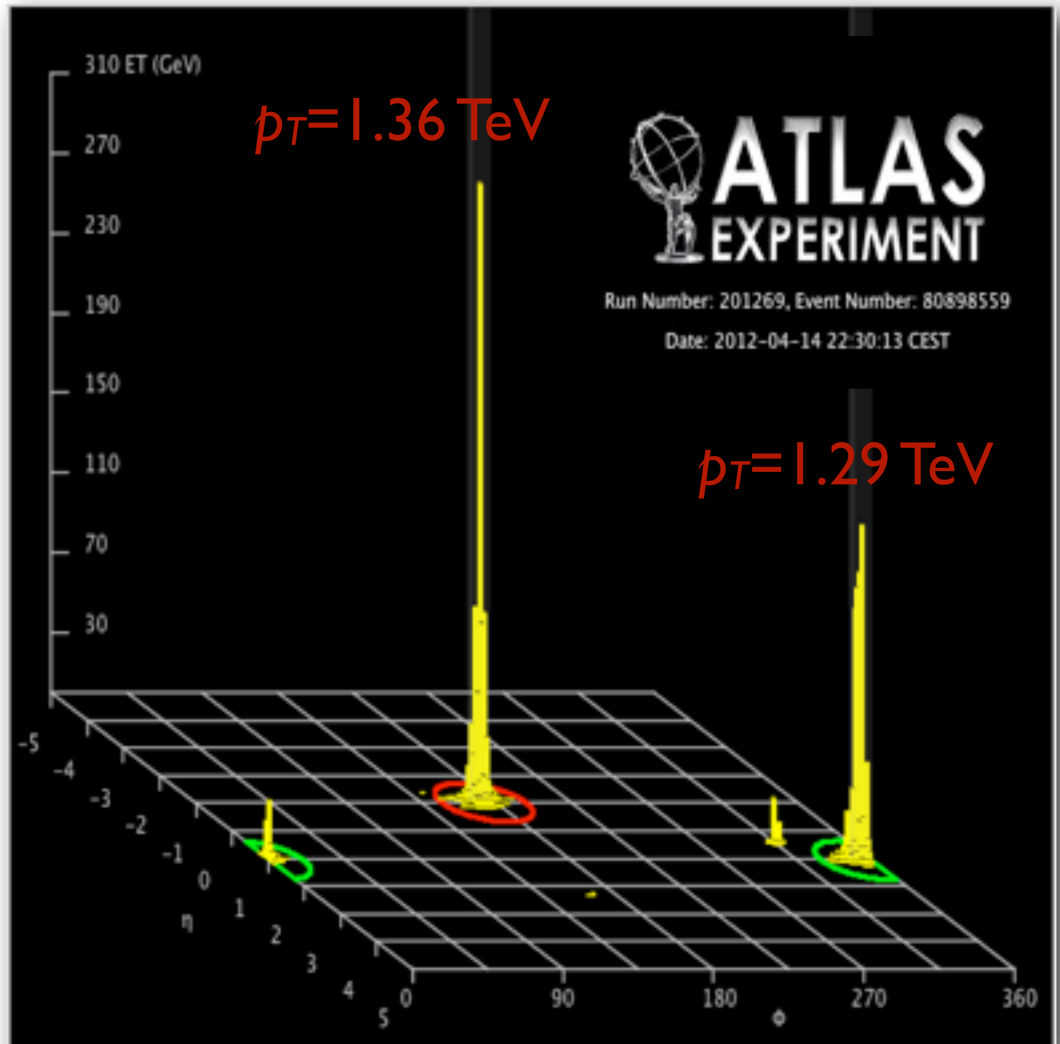
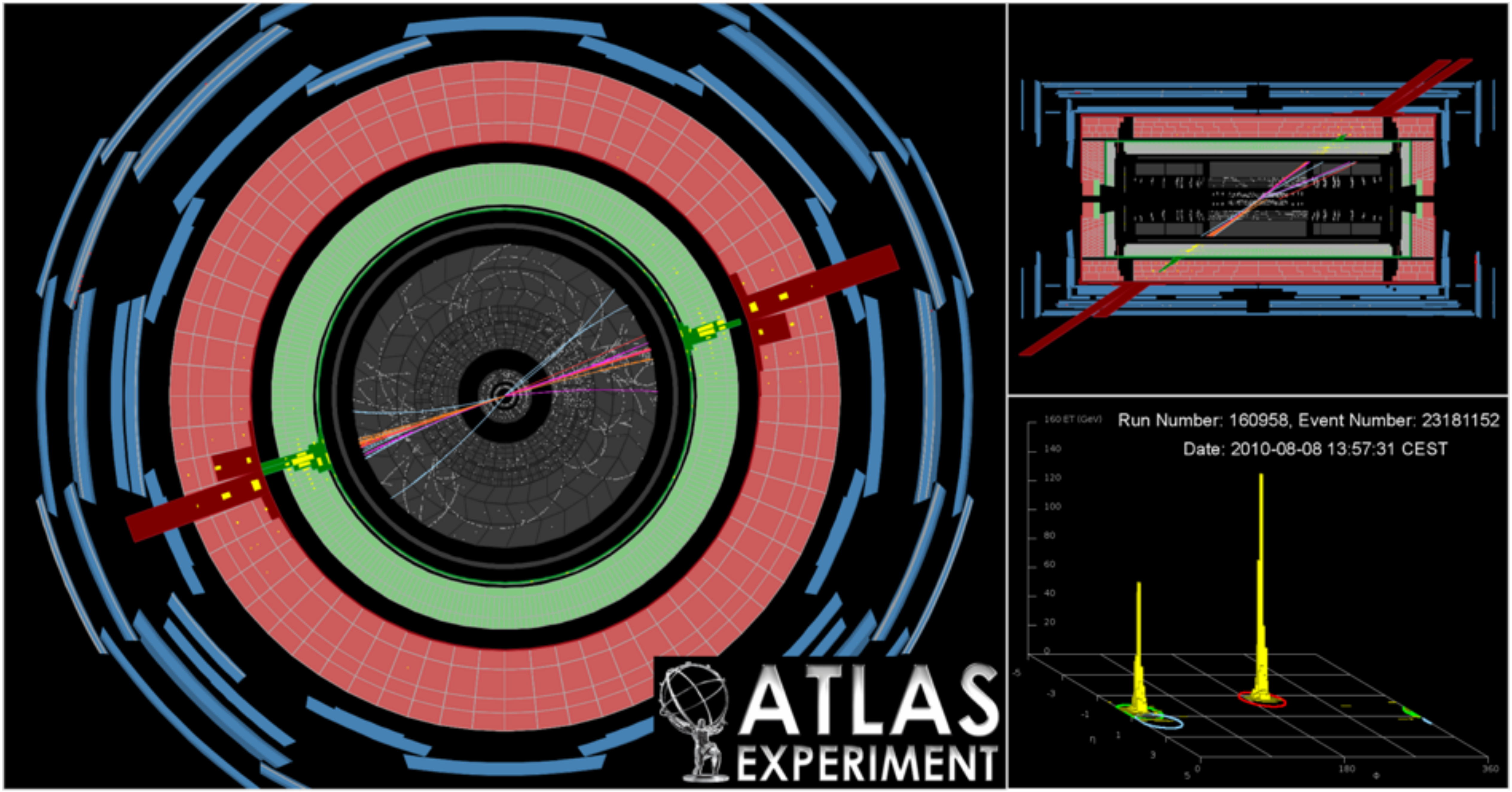
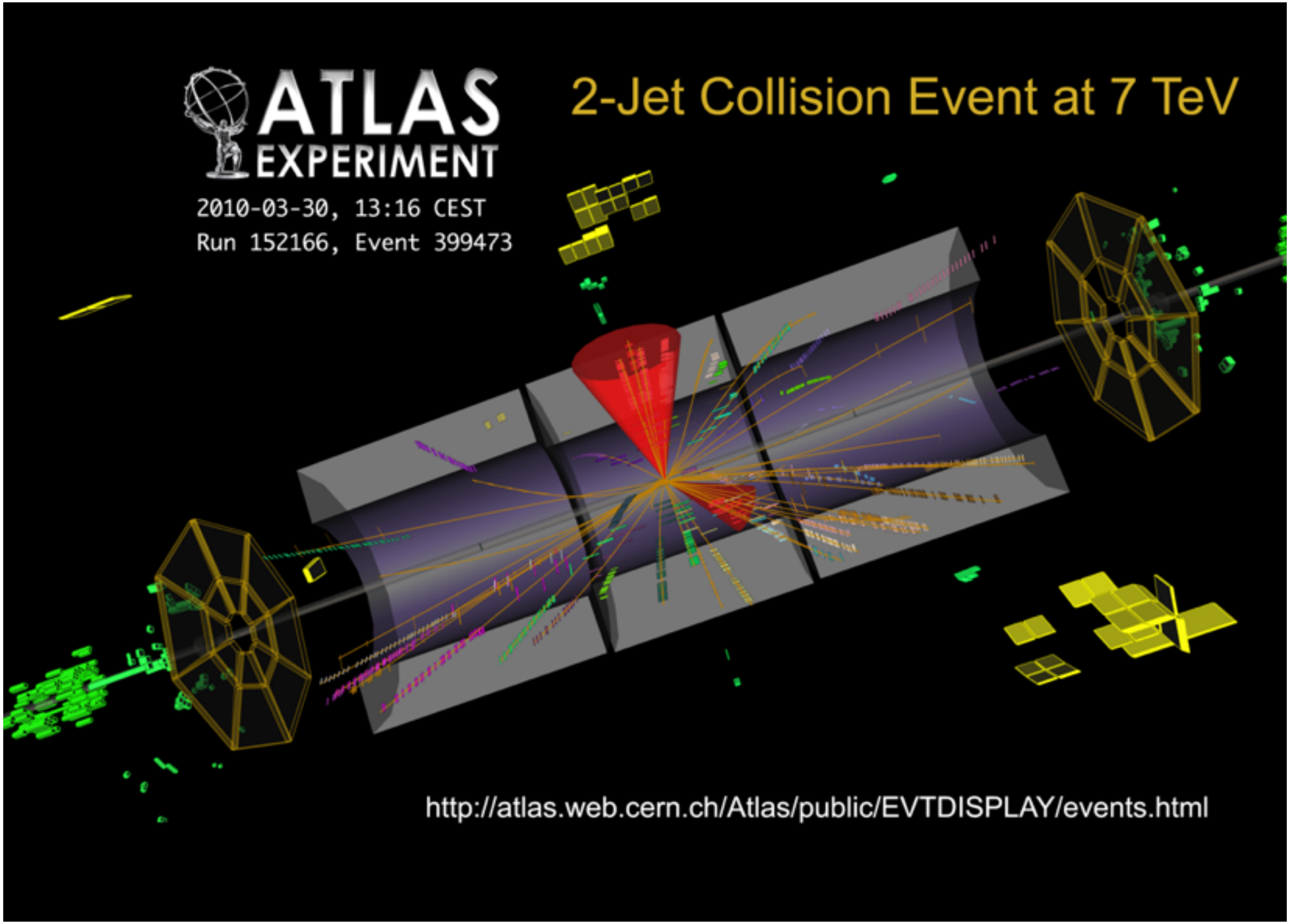
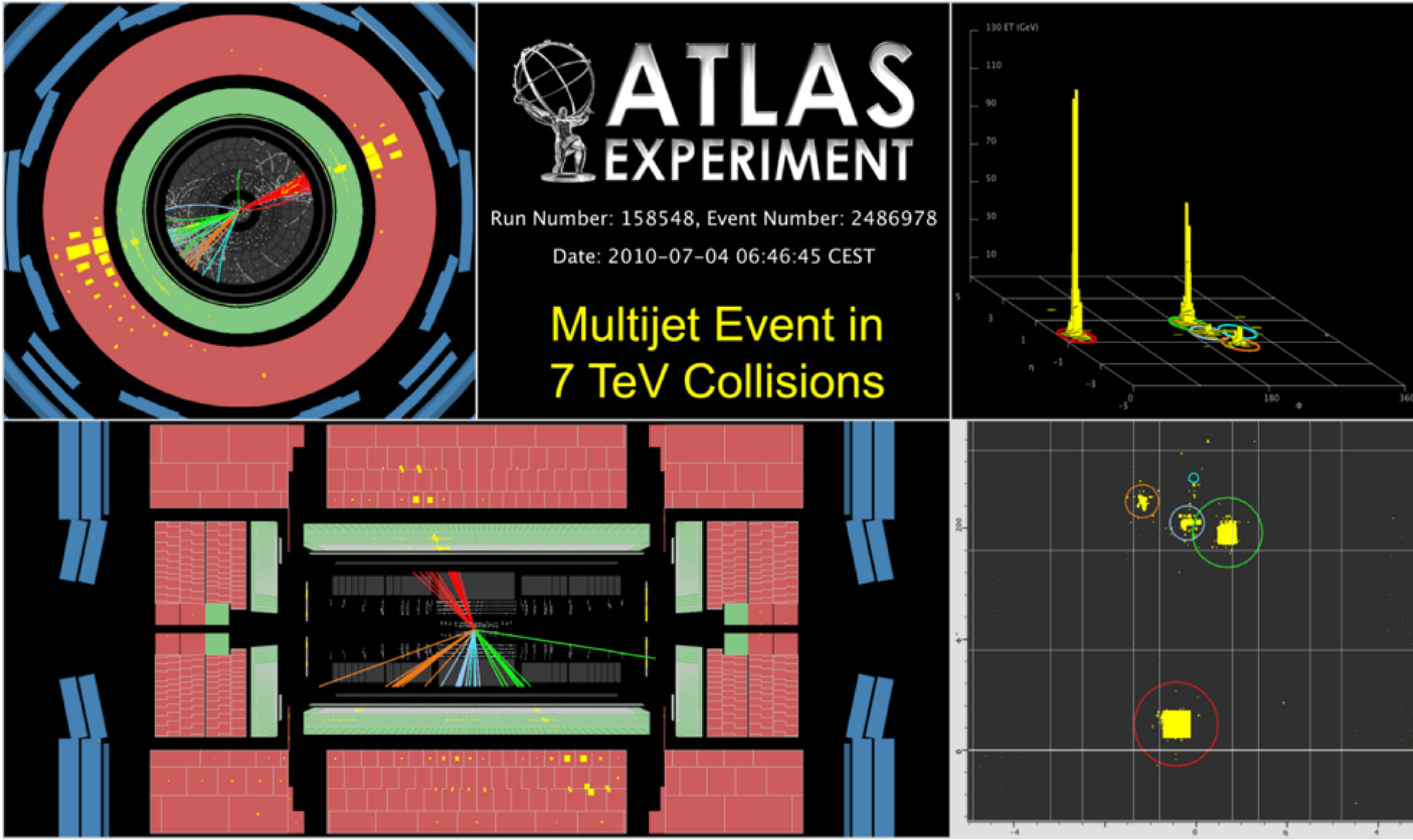

310 ET (GeV)
270
230
190
150
110
70
30
p_T=1.36 TeV
ATLAS
EXPERIMENT
Run Number: 201269, Event Number: 80898559
Date: 2012-04-14 22:30:13 CEST
p_T=1.29 TeV
-5
-4
-3
-2
-1
0
1
2
3
4
5
η
0
90
180
270
360
ϕ

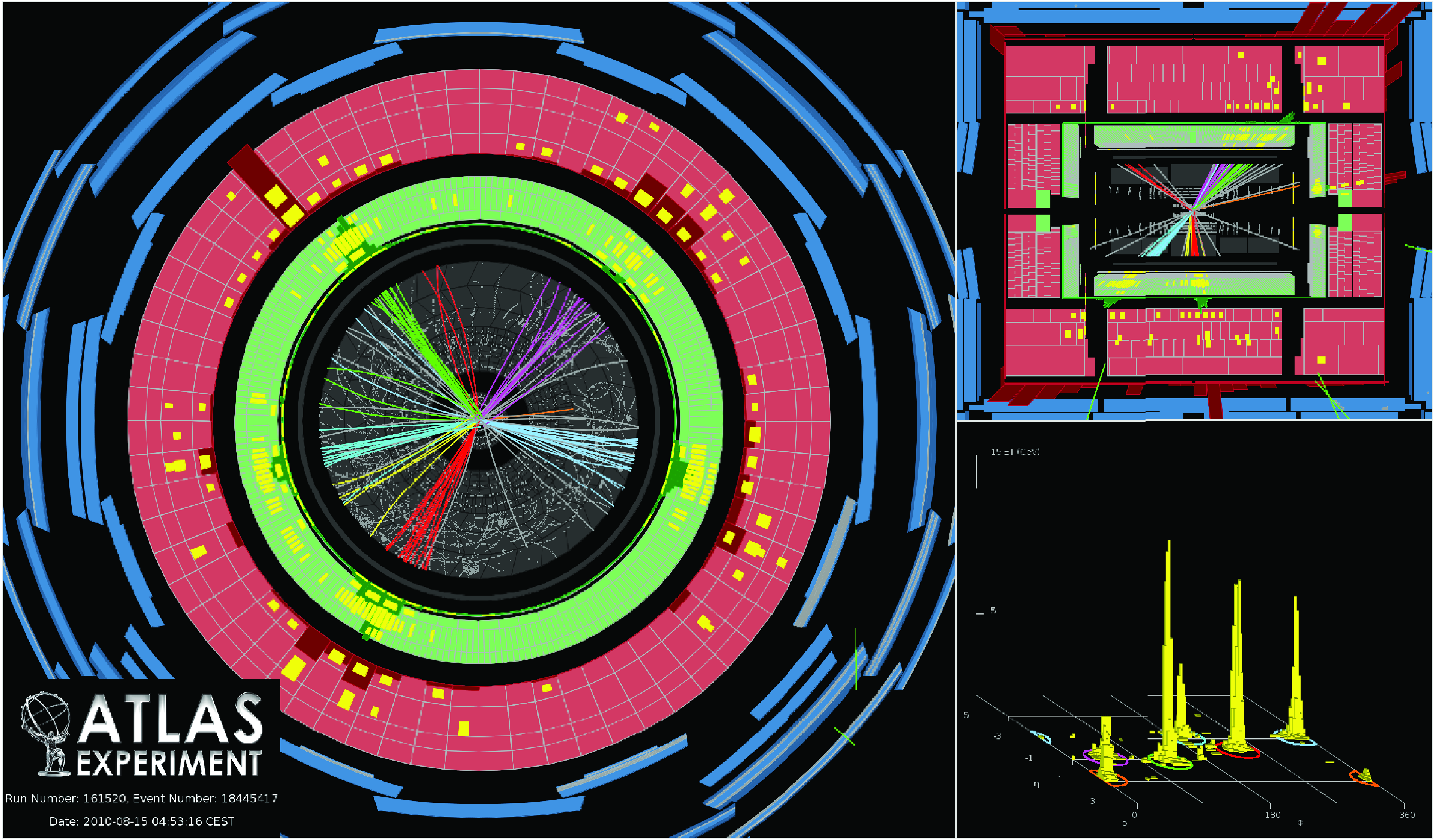
Jets

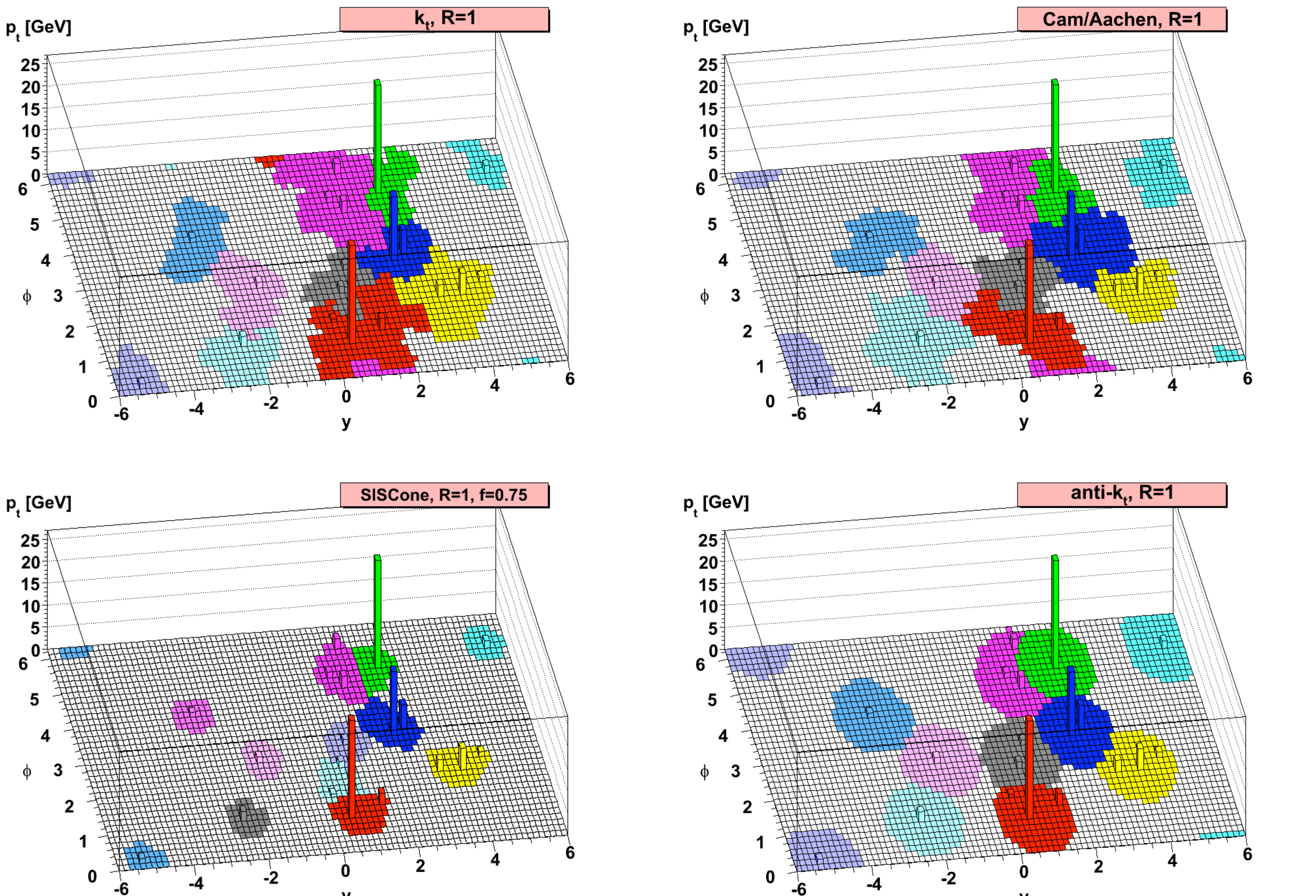


Run Number: 160958, Event Number: 23181152
Date: 2010-08-08 13:57:31 CEST
ATLAS
EXPERIMENT

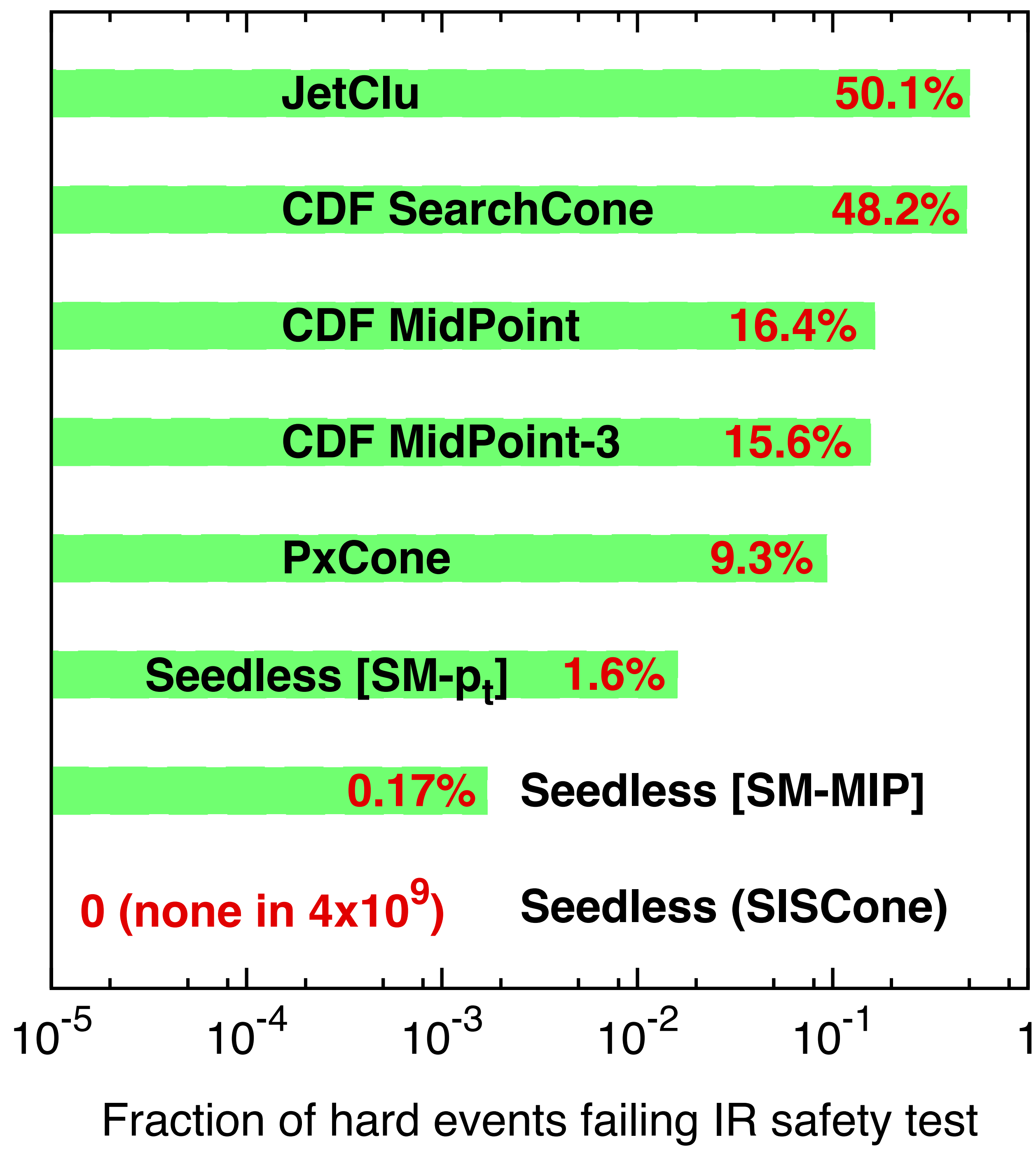

ATLAS
EXPERIMENT
2-Jet Collision Event at 7 TeV
2010-03-30, 13:16 CEST
Run 152166, Event 399473
http://atlas.web.cern.ch/Atlas/public/EVTDISPLAY/events.html


ATLAS EXPERIMENT
Run Number: 158548, Event Number: 2486978
Date: 2010-07-04 06:46:45 CEST
Multijet Event in
7 TeV Collisions


ATLAS
EXPERIMENT
Run Number: 161520, Event Number: 18445417
Date: 2010-08-15 04:53:16 CEST
5
-3
-1
η
3
0
180
φ
360



k_t, R=1
Cam/Aachen, R=1
SISCone, R=1, f=0.75
anti-k_t, R=1
p_t [GeV]
ϕ
y



JetClu
50.1%
CDF SearchCone
48.2%
CDF MidPoint
16.4%
CDF MidPoint-3
15.6%
PxCone
9.3%
Seedless [SM-p_t]
1.6%
0.17%
Seedless [SM-MIP]
0 (none in $4x10^9$)
Seedless (SISCone)
10^{-5}
10^{-4}
10^{-3}
10^{-2}
10^{-1}
1
Fraction of hard events failing IR safety test

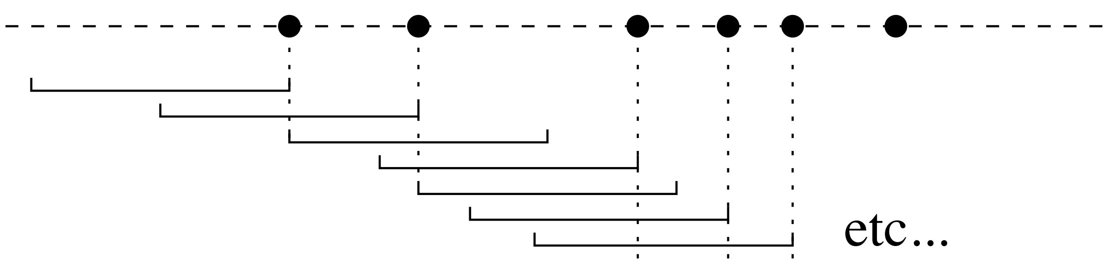


Figure 8: Representation of points on a line and the places where a sliding segment has a change in its set of enclosed points.

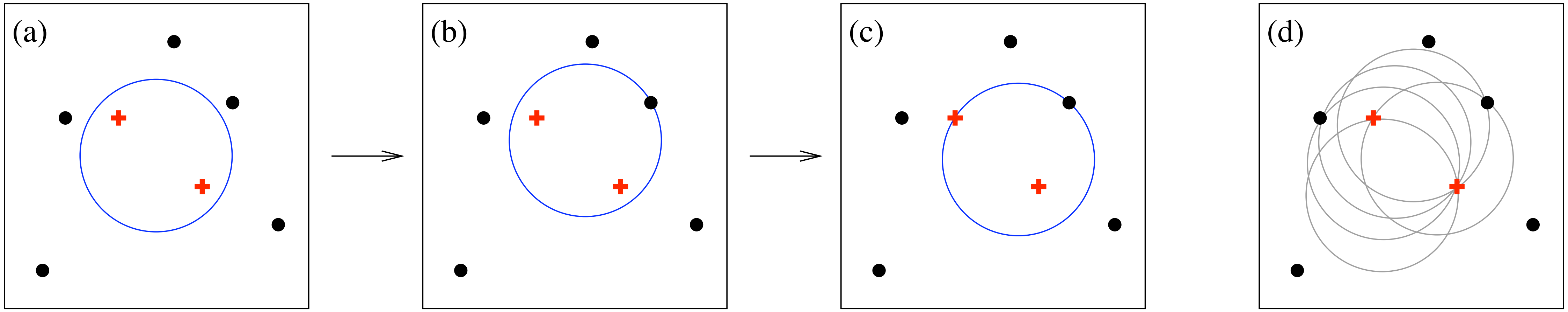


Figure 9: (a) Some initial circular enclosure; (b) moving the circle in a random direction until some enclosed or external point touches the edge of the circle; (c) pivoting the circle around the edge point until a second point touches the edge; (d) all circles defined by pairs of edge points leading to the same circular enclosure.

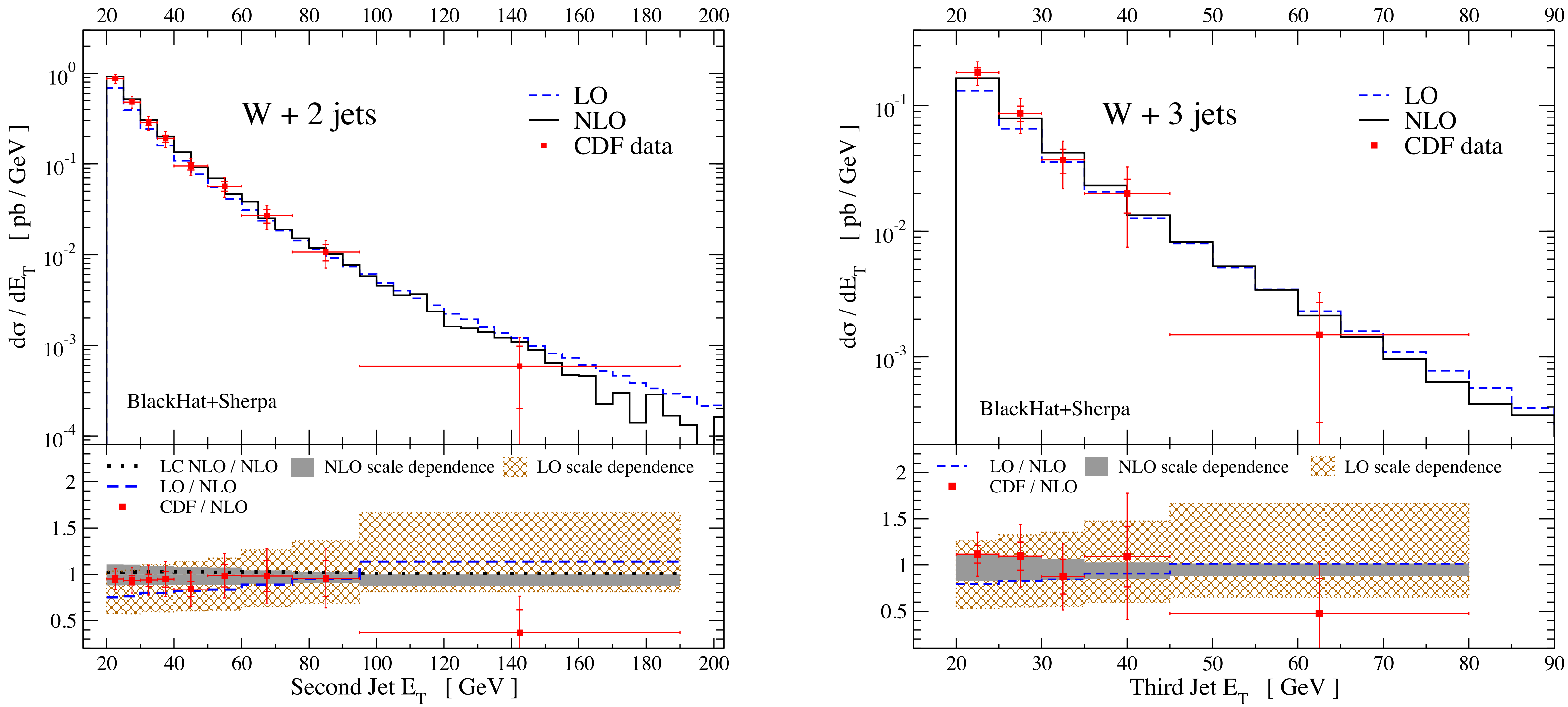
G. Salam 0906.1833

Split-merge procedure

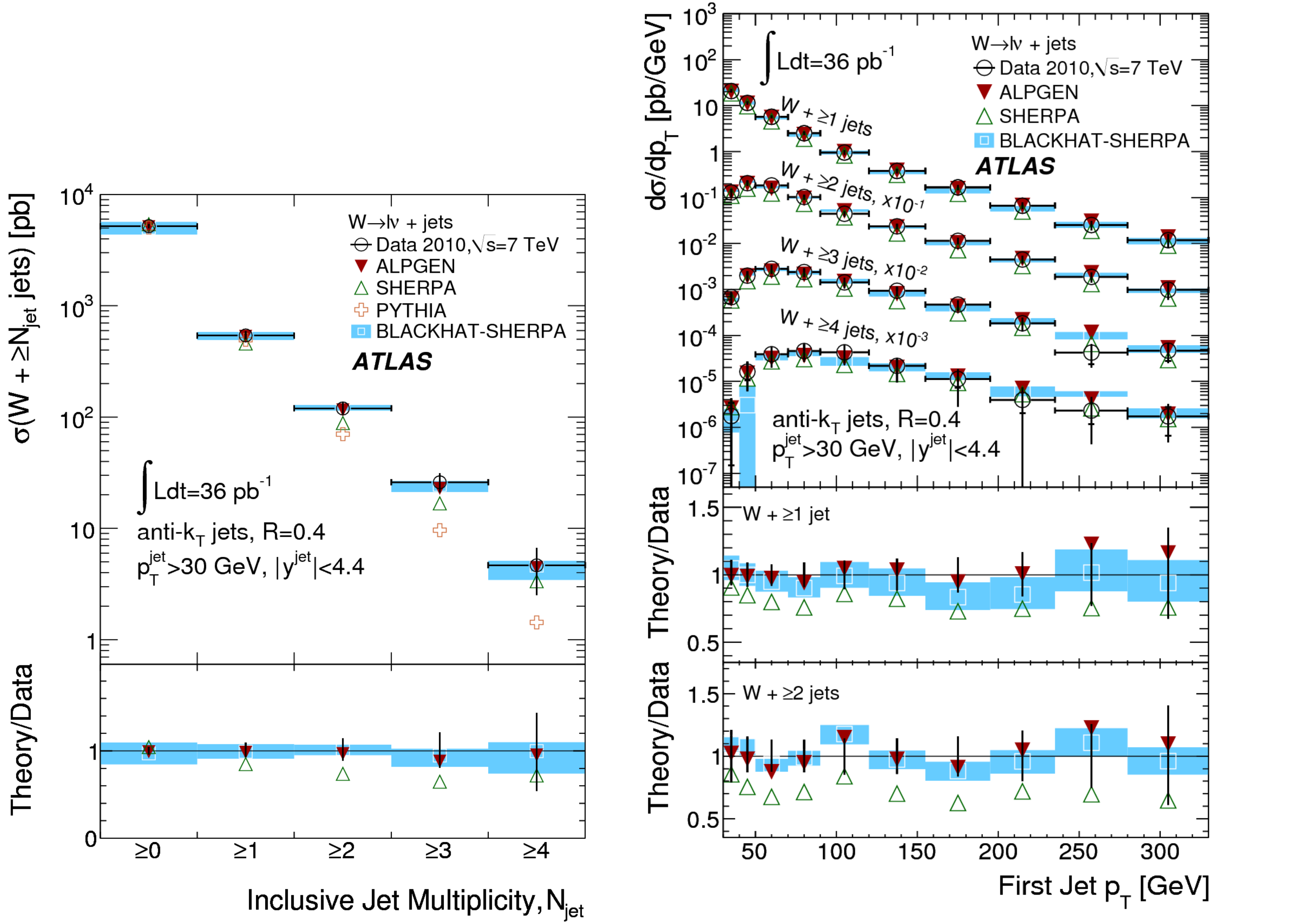
from G. Salam 0906.1833

1. Take the protojet with the largest p_t (the 'hardest' protojet), label it a.
2. Find the next hardest protojet that shares particles with the a (i.e. overlaps), label it b. If no such protojet exists, then remove a from the list of protojets and add it to the list of final jets.
3. Determine the total p_t of the particles shared between the two protojets, $p_{t,\mathrm{shared}}$.
    - If $p_{t,\mathrm{shared}}/p_{t,b} > f$, where f is a free parameter known as the overlap threshold, replace protojets a and b with a single merged protojet.
    - Otherwise "split" the protojets, for example assigning the shared particles just to the protojet whose axis is closer (in angle).
4. Then repeat from step 1 as long as there are protojets left.

Note: the protojets are initially all stable cones.



The CDF analysis [2] employs the JETCLU cone algorithm [27] with a cone radius $R = \sqrt{(\Delta\phi)^2 + (\Delta\eta)^2} = 0.4$. However, this algorithm is not generally infrared safe at NLO, so we instead use the seedless cone algorithm SISCone [28]. In general, at the partonic level we



W→lν + jets
Data 2010,√s=7 TeV
ALPGEN
SHERPA
PYTHIA
BLACKHAT-SHERPA
ATLAS
∫Ldt=36 pb^-1
anti-k_T jets, R=0.4
p_T^jet>30 GeV, |y^jet|<4.4
σ(W + ≥N_jet jets) [pb]
Theory/Data
Inclusive Jet Multiplicity, N_jet
≥0
≥1
≥2
≥3
≥4
dσ/dp_T [pb/GeV]
W + ≥1 jets
W + ≥2 jets, x10^-1
W + ≥3 jets, x10^-2
W + ≥4 jets, x10^-3
W + ≥1 jet
W + ≥2 jets
First Jet p_T [GeV]