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Survey of the H1 papers for Rivet / HZtool





H1 information



- H1 papers are listed on this page, including auxillary information (tables, figures, etc)
 - https://www-h1.desy.de

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H1/DESY/HEP Dates			e h1news email list			Meetings				
H1 Calendar:	2019 older -			8		• meetings		€ WG.com/e		
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S.Schmitt, H1 analyses in Rivet





- Approximate grouping into topics
- Check whether analyses are in Hztool or in Rivet

	Total	HZtool	Rivet
searches/rare processes	48	0	0
inclusive	36	4	0
electroweak	4	0	0
diffraction	10	1	0
exclusive final states	23	0	0
charm and beauty	24	7	0
jets	49	21	1
hadronic final state	37	16	2
	231	49	3

Only 3 analyses are in Rivet These are duplicate with HZtool

And only 49/231 analyses are in HZtool

Following pages: more details grouped by topic

much more precise

A total of **98** analyses are in these ulletInclusive Measurement of Diffractive HZ97158 Deep-Inelastic ep Scattering categories A Measurement and QCD Analysis of HZ96039 the Proton Structure Function F2(x,Q2) "Inclusive" here also includes at HFRA inclusive diffraction (scattered First Measurement of the Deep-HZ95036 electron + rapidity gap or fwd proton) Inelastic Structure of Proton Diffraction Deep-Inelastic Inclusive ep Scattering HZ00181 Only 5 analyses in HZtool (most at Low x and a Determination of ۲ alpha s recent from 2000) – many H1 Measurement of Leading Proton and HZ98169 analyses on these topics were **Neutron Production in Deep Inelastic** published after that date and are Scattering at HERA

These analyses are important for PDFs and diffractive PDFs. Maybe less interesting for MC model builders and Rivet users?

Searches/inclusive/diffraction/electroweak



Exclusive final states



- **23** analyses in this category
- **0** analyses in HZtool
- Diffractive signature plus fully reconstructed final state
- Typically a vector meson or a photon
- At LHC corresponding to "central exclusive production"

• A few recent examples

arxiv:0907.5289	Diffractive Electroproduction of rho and
DESY 09-093	phi Mesons at HERA
arxiv:0907.5289	Deeply Virtual Compton Scattering and
DESY 09-109	its Beam Charge Asymmetry in e^\pm p
	Collisions at HERA
arxiv:1508.03176	Elastic and Proton-
DESY 13-058	DissociativePhotoproduction of J/psi
	Mesonsat HERA
arxiv:1508.03176	Exclusive rho0 Meson Photoproduction
DESY 15-120	with a Leading Neutron at HERA

Should this be changed or are these processes not interesting for Rivet?



Charm and beauty production



- A total of **24** H1 analyses
- And 7 are in HZtool
- The missing analyses are the **most precise ones**
- We even have combined H1+ZEUS results to be added

Included in HZtool

Inclusive D*-Meson Cross Sections and D*-Jet Correlations in	
Photoproduction at HERA	HZH0608042
Inclusive Production of D^+, D^0, D_s^+ and D^*+ Mesons in Deep	
Inelastic Scattering at HERA	HZH0408149
D^(*+-) Meson Production in Deep-Inelastic Diffractive Interactions	
at HERA	HZH0108047
Measurement of Open Beauty Production at HERA	HZ99126
Measurement of D^* Meson Cross Sections at HERA and	
Determination of the Gluon Density in the Proton	HZ98204
Inclusive D0 and D+/- Production in Deep-Inelastic ep Scattering at	
HERA	HZ96138
Measurement of D^(*+-) Meson Production and F_2^c in Deep-	
Inelastic Scattering at HERA	HZ01100
Inelastic Scattering at HERA	HZ01100

Six most recent results not yet in HZtool

DESY 12-059	Measurement of Beauty and Charm Photoproduction using Semi-muonic Decays in Dijet Events at HERA
DESY 12-072	Measurement of Beauty Photoproduction near Threshold using Di-electron Events with the H1 Detector at HERA
DESY 12-172	Combination and QCD Analysis of Charm Production Cross Section Measurements in Deep-Inelastic ep Scattering at HERA
DESY 15-037	Combination of Differential D^{*+-} Cross-Section Measurements in Deep-Inelastic ep Scattering at HERA
DESY 17-043	Measurement of D* Production in Diffractive Deep Inelastic Scattering at HERA
DESY 18-037	Combination and QCD analysis of beauty and charm production cross section measurements in deep inelastic ep scattering at



Analyses with jets (in HZtool)



- Forward Jet Production in Deep Inelastic Scattering at HERA HZH0508055 • 49 analyses total Energy Flow and Rapidity Gaps Between Jets in Photoproduction at HERA HZ02023 Measurement of Dijet Cross Sections in Photoproduction at HERA HZ01225 Measurement of Dijet Electroproduction at Small Jet Separation #N/A • **21** in HZtool Photoproduction of Dijets with High Transverse Momenta at HERA HZH0603014 Measurement of Beauty Production at HERA Using Events with Muons and Jets HZH0502010 Not in HZtool: Measurement of inclusive jet cross sections in photoproduction at HERA HZH0302034 • Measurement of Internal Jet Structure in Di-jet Production in Deep Inelastic Scattering at HERA HZ98210 precision jet Measurement of Dijet Cross-Sections at Low Q2 and the Extraction of an Effective Parton Density for tHZ98205 Forward Jet and Particle Production at HERA HZ98143 cross sections, HZ98092 Diffractive Dijet Production at HERA Multi-Jet Event Rates in Deep-Inelastic Scattering and Determination of the Strong Coupling Constant HZ98087 trijets, jet+ extra Di-Jet Event Rates in Deep-Inelastic Scattering at HERA HZ98076 Thrust Jet Analysis of Deep-Inelastic Large-Rapidity-Gap Events HZ97210 conditions Measurement of the Inclusive Di-Jet Cross Section in Photoproduction and Determination of an EffectivHZ97164 Jets and Energy Flow in Photon-Proton Collisions at HERA HZ95219 (diffractive, Transverse Energy and Forward Jet Production in the Low x Regime at HERA HZ95108 Measurement of Dijet Production at Low Q^2 at HERA HZ03206 heavy flavour) Inclusive Dijet Production at Low Bjorken-x in Deep Inelastic Scattering HZ03160 Measurement of Inclusive Jet Cross-Sections in Deep-Inelastic ep-Scattering at HERA HZ02079 Diffractive Jet Production in Deep-Inelastic ep Collisions at HERA HZ00174 HZ00035
 - Measurement of Di-jet Cross-Sections in Photoproduction and Photon Structure



Analyses with jets (not in HZtool)



_	10 analyza tatal	DESY 00-145	Measurement and QCD Analysis of Jet Cross Sections in Deep-Inelastic Positron-Proton Collisions	s at sqrt(s) c
•	49 analyses total	DESY 01-073	Three-Jet Production in Deep-Inelastic Scattering at HERA	
	-	DESY 04-247	Measurement of Dijet Cross Sections in ep Interactions with a LeadingNeutronat HERA	
•	21 in HZtool	DESY 06-039	Measurement of Charm and Beauty Dijet Cross Sections in Photoproduction at HERA using the H1	Vertex Det
•		DESY 07-018	Tests of QCD Factorisation in the Diffractive Production of Dijets in Deep-Inelastic Scattering and F	hotoproduc
		DESY 07-073	Measurement of Inclusive Jet Production in Deep-Inelastic Scattering at High \$Q^2\$ and Determin	ation of the
•	Not in HZtool:	DESY 07-115	Dijet Cross Sections and Parton Densities in Diffractive DIS at HERA	
		DESY 07-200	Three- and Four-jet Production at Low x at HERA	
	precision jet	DESY 09-032	Jet Production in ep Collisions at High Q^2 and Determination of alpha_s	
		DESY 09-162	Jet Production in ep Collisions at Low Q^2 and Determination of alpha_s	
	cross sections,	DESY 10-043	Diffractive Dijet Photoproduction in ep Collisions at HERA	
	· · · · · · · · · · · · · · · · · · ·		Measurement of Charm and Beauty Jets in Deep Inelastic Scattering at HERA	
	trijets, jet+ extra	DESY 11-166	Measurement of Dijet Production in Diffractive Deep-Inelastic Scattering with a Leading Proton at H	
		DESY 11-183	Measurement of the Azimuthal Correlation between the most Forward Jet and the Scattered Positro	•
	conditions		Measurement of Multijet Production in ep Collisions at High Q^2 and Determination of the Strong C	oupling alpr
	(diffuenting)	DESY 14-200	Measurement of Dijet Production in Diffractive Deep-Inelastic ep Scattering at HERA	
	(diffractive,	DESY 14-242	5 1	
	hoover floweur)	DESY 16-200	····· · · · · · · · · · · · · · · · ·	
	heavy flavour)	DESY 17-137	Determination of the strong coupling constant alpha _s (M _Z) in next-to-next	t-to-leading
			Hard Scattering in gamma-p interactions	
		DESY 93-100	Measurement of Inclusive Jet Cross Sections in Photoproduction at HERA	
ما بر ا	nink this should be		A Measurement of Multi-jet Rates in Deep-Inelastic-Scattering at HERA	
i th		DESY 94-220	Determination of the Strong Coupling Constant from Jet Rates in Deep Inelastic Scattering	
improved			A Direct Determination of the Gluon Density in the Proton at Low x	
μιμ		DESY 97-179	Low Q2 Jet Production at HERA and Virtual Photon Structure	
Fe	b 2019		S.Schmitt, H1 analyses in Rivet	8





- **37** analysis total
- 16 in HZtool
- As for jets, the most precise or most differential results are not covered

Charged Particle Cross Sections in Photoproduction and Extraction of the Gluon Density	HZH9810020
Measurement of Event Shape Variables in Deep-Inelastic Scattering at HERA	HZh0512014
Measurement of Prompt Photon Cross Sections in Photoproduction at HERA	HZh0407018
Inclusive Photoproduction of Neutral Pions in the Photon Hemisphere at HERA	HZH0006017
Investigation of Power Corrections to Event Shape Variables measured in Deep-Inelastic	:HZ99193
Forward Pi0-Meson Production at HERA	HZ99094
Measurements of Transverse Energy Flow in Deep-Inelastic Scattering at HERA	HZ99091
Multiplicity Structure of Hadronic Final States in Diffractive Deep-Inelastic Scattering at	HZ98044
Hadron Production in Diffractive Deep Inelastic Scattering	HZ98029
Evolution of ep Fragmentation and Multiplicity Distributions in the Breit Frame	HZ97108
Measurement of Event Shape Variables in Deep Inelastic ep Scattering	HZ97098
Measurement of Charged Particle Transverse Momentum Spectra in Deep Inelastic Scatt	(HZ96215
Charged Particle Multiplicities in Deep-Inelastic Scattering at HERA	HZ96160
Strangeness Production in Deep Inelastic Positron-Proton Scattering at HERA	HZ96122
A Study of the Fragmentation of Quarks in ep Collisions at HERA	HZ95072
Energy Flow and Charged Particle Spectra in Deep Inelastic Scattering at HERA	HZ94033



Measurements of the HFS (not in HZtool)



- **37** analysis total
- 16 in HZtool
- As for jets, the most precise or most differential results are not covered

I think this should be improved

DESY 02-059 Inelastic Photoproduction of J/Psi Mesons at HERA DESY 02-060 Inelastic Leptoproduction of J/Psi Mesons at HERA DESY 04-032 Measurement of Anti-Deuteron Production and a Search for Heavy Stable Charged Particles at DESY 04-051 Forward pi[^]0 Production and Associated Transverse Energy Flow in Deep-Inelastic Scattering a DESY 07-065 Charged Particle Production in High Q² Deep-Inelastic Scattering at HERA DESY 07-147 Measurement of Isolated Photon Production in Deep-Inelastic Scattering at HERA DESY 08-095 Strangeness Production at low Q² in Deep-Inelastic ep Scattering at HERA DESY 08-172 Inclusive Photoproduction of rho^0,K^{*0} and \phi Mesons at HERA DESY 09-084 Observation of the Hadronic Final State Charge Asymmetry in High Q^2 Deep-Inelastic Scatteri DESY 09-135 Prompt Photons in Photoproduction at HERA DESY 09-185 Measurement of Leading Neutron Production in Deep-Inelastic Scattering at HERA DESY 09-225 Inelastic Production of J/psi Mesons in Photoproduction and Deep Inelastic Scattering at HERA DESY 11-093 Measurement of Photon Production in the Very Forward Direction in Deep-Inelastic Scattering a DESY 13-012 Measurement of Charged Particle Spectra in Deep-Inelastic ep Scattering at HERA DESY 14-035 Measurement of Feynman-x Spectra of Photons and Neutrons in the Very Forward Direction inE DESY 92-162 Measurement of the Hadronic Final State in Deep Inelastic Scattering at HERA DESY 94-030 Inclusive Charged Particle Cross Sections in Photoproduction at HERA DESY 95-156 Comparison of Deep Inelastic Scattering with Photoproduction Interactions at HERA DESY 96-014 Energy Flow in the Hadronic Final State of Diffractive and Non-Diffractive Deep-Inelastic Scatte DESY 97-075 Bose-Einstein Correlations in Deep Inelastic ep Scattering at HERA DESY 97-095 Photoproduction of K⁰ and Lambda at HERA and a Comparison with Deep Inelastic Scattering







- Only 3 H1 analyses in Rivet (and these are also in HZtool)
- In HZtool there are 49 analyses
- The total number of papers is 231
- Subtracting searches/inclusive/inclusive difraction/electroweak there are 44/133 analyses in HZtool (2/3 missing)
- The missing analyses typically are the most precise ones
- H1 does not have many active members anymore: we can not do all the work