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# Data formats in RecoBTag

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CMSSW\_3\_6\_x More [▢](#) CMSSW\_3\_6\_x Less [▢](#) (*basic structure valid from CMSSW\_3\_6\_0 onward*)

InputTag/Module (Instance name)	Containers	Description
<b><i>b-tag intermediate collections (in RECO and AOD)</i></b>		
btagSoftElectrons	reco::Electron <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Electron candidates identified by the dedicated btagging SoftElectronProducer <a href="#">↗</a> , starting from reco::Tracks <a href="#">↗</a>
softElectronTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft electron dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft electron in the jet
impactParameterTagInfos	reco::TrackIPTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains information used for btagging about track properties such as impact parameters, decay len, probability to originate from the primary vertex. Uses ak5JetTracksAssociatorAtVertex collection as input.
secondaryVertexTagInfos	reco::SecondaryVertexTagInfo (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains the reconstructed displaced secondary vertices in a jet and associated information, uses impactParameterTagInfos <a href="#">↗</a> as input
ghostTrackVertexTagInfos		
<b><i>b-tag algorithm result collections (in RECO and AOD)</i></b>		
softMuonTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft muon dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft muon in the jet
softElectronBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftElectronTagInfo and the default soft electron tagger, which uses a neural network to combine most electron properties to improve rejection of non-b jets
softMuonBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties to improve rejection of non-b jets
jetProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm (based on TrackIPTagInfo).
jetBProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	

		result of jetProbability algorithm in the "jetBProbability" variant.
trackCountingHighPurBJetTags	reco::JetTag (lxr cvs)	Result of track counting algorithm (requiring <b>three</b> tracks to have a significance above the discriminator). To be used for high purity selection (B eff < 50%, mistag rate < 1% )
trackCountingHighEffBJetTags	reco::JetTag (lxr cvs)	Result of track counting algorithm (requiring <b>two</b> tracks to have a significance above the discriminator). To be used for high efficiency selection (B eff > 50%, mistag rate > 1% )
simpleSecondaryVertexHighPurBJetTags	reco::JetTag (lxr cvs)	Uses the flight distance (i.e. distance between a reconstructed secondary vertex and the primary vertex in a jet) as b-tagging discriminator. Secondary vertex is reconstructed with <b>three</b> or more tracks.
simpleSecondaryVertexHighEffBJetTags	reco::JetTag (lxr cvs)	Uses the flight distance (i.e. distance between a reconstructed secondary vertex and the primary vertex in a jet) as b-tagging discriminator. Secondary vertex is reconstructed with <b>two</b> or more tracks. Can be configured to return the value or significance in 2d and 3d, optionally corrected for the boost at the SV - works up to a maximum secondary vertex finding efficiency of ~70% in b-jets
combinedSecondaryVertexBJetTags	reco::JetTag (lxr cvs)	Result of application of a likelihood estimator to the tagging variables for the three possible algorithm outcomes (tracks only, pseudo vertex from at least two tracks or successful secondary vertex fit), obtained from impactParameterTagInfos and secondaryVertexTagInfos
combinedSecondaryVertexMVABJetTags	reco::JetTag (lxr cvs)	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the impactParameterTagInfos and secondaryVertexTagInfos with an uptodate calibration from the the CMS conditions database, using a neural network instead of a likelihood ratio in case an actual secondary vertex was

		reconstructed
ghostTrackBJetTags		

CMSSW\_3\_0\_x More [▣](#) CMSSW\_3\_0\_x Less [▣](#) (basic structure valid from CMSSW\_3\_0\_0 onward upto 3\_5\_x)

InputTag/Module (Instance name)	Containers	Description
<b><i>b-tag intermediate collections (in RECO and AOD)</i></b>		
btagSoftElectrons	reco::Electron <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Electron candidates identified by the dedicated btagging SoftElectronProducer <a href="#">↗</a> , starting from reco::Tracks <a href="#">↗</a>
softElectronTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft electron dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft electron in the jet
impactParameterTagInfos	reco::TrackIPTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains information used for btagging about track properties such as impact parameters, decay len, probability to originate from the primary vertex. Uses ak5JetTracksAssociatorAtVertex collection as input.
secondaryVertexTagInfos	reco::SecondaryVertexTagInfo (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains the reconstructed displaced secondary vertices in a jet and associated information, uses impactParameterTagInfos <a href="#">↗</a> as input
<b><i>b-tag algorithm result collections (in RECO and AOD)</i></b>		
softMuonTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft muon dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft muon in the jet
softElectronBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftElectronTagInfo and the default soft electron tagger, which uses a neural network to combine most electron properties to improve rejection of non-b jets
softMuonBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties to improve rejection of non-b jets
jetProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm (based on TrackIPTagInfo).
jetBProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm in the "jetBProbability" variant.
trackCountingHighPurBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of track counting algorithm (requiring <b>three</b> tracks to have a

		significance above the discriminator). To be used for high purity selection (B eff < 50%, mistag rate < 1% )
trackCountingHighEffBJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Result of track counting algorithm (requiring <b>two</b> tracks to have a significance above the discriminator). To be used for high efficiency selection (B eff > 50%, mistag rate > 1% )
simpleSecondaryVertexBJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Uses the flight distance (i.e. distance between a reconstructed secondary vertex and the primary vertex in a jet) as b-tagging discriminator. Can be configured to return the value or significance in 2d and 3d, optionally corrected for the boost at the SV - works up to a maximum secondary vertex finding efficiency of ~70% in b-jets
combinedSecondaryVertexBJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Result of application of a likelihood estimator to the tagging variables for the three possible algorithm outcomes (tracks only, pseudo vertex from at least two tracks or successful secondary vertex fit), obtained from impactParameterTagInfos and secondaryVertexTagInfos
combinedSecondaryVertexMVABJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the impactParameterTagInfos and secondaryVertexTagInfos with an uptodate calibration from the the CMS conditions database, using a neural network instead of a likelihood ratio in case an actual secondary vertex was reconstructed

CMSSW\_2\_1\_x More [▢](#) CMSSW\_2\_1\_x Less [▢](#) (basic structure valid from CMSSW\_1\_7\_0 onward)

InputTag/Module (Instance name)	Containers	Description
<b><i>b-tag intermediate collections (in RECO and AOD)</i></b>		
btagSoftElectrons	reco::Electron <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Electron candidates identified by the dedicated btagging SoftElectronProducer <a href="#">(lxr)</a> , starting from reco::Tracks <a href="#">(lxr)</a>
softElectronTagInfos		

	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft electron dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft electron in the jet
impactParameterTagInfos	reco::TrackIPTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains information used for btagging about track properties such as impact parameters, decay len, probability to originate from the primary vertex. Uses ic5JetTracksAssociatorAtVertex collection as input.
secondaryVertexTagInfos	reco::SecondaryVertexTagInfo (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains the reconstructed displaced secondary vertices in a jet and associated information, uses impactParameterTagInfos <a href="#">↗</a> as input
<b><i>b-tag algorithm result collections (in RECO and AOD)</i></b>		
softMuonTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft muon dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft muon in the jet
softElectronBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftElectronTagInfo and the default soft electron tagger, which uses a neural network to combine most electron properties to improve rejection of non-b jets
softMuonBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties to improve rejection of non-b jets
softMuonNoIPBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties except the impact parameter to improve rejection of non-b jets
jetProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm (based on TrackIPTagInfo).
jetBProbabilityBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm in the "jetBProbability" variant.
trackCountingHighPurBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of track counting algorithm (requiring <b>three</b> tracks to have a significance above the discriminator). To be used for high purity selection (B eff < 50%, mistag rate < 1% )
trackCountingHighEffBJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of track counting algorithm (requiring <b>two</b> tracks to have a significance above the

		discriminator). To be used for high efficiency selection (B eff > 50%, mistag rate > 1% )
impactParameterMVABJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the impactParameterTagInfos with an up-to-date calibration from the the CMS conditions database, making use of more general multivariate analysis techniques, like neural networks. <i>Has been discontinued, do not use</i>
simpleSecondaryVertexBJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Uses the flight distance (i.e. distance between a reconstructed secondary vertex and the primary vertex in a jet) as b-tagging discriminator. Can be configured to return the value or significance in 2d and 3d, optionally corrected for the boost at the SV - works up to a maximum secondary vertex finding efficiency of ~70% in b-jets
combinedSecondaryVertexBJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Result of application of a likelihood estimator to the tagging variables for the three possible algorithm outcomes (tracks only, pseudo vertex from at least two tracks or successful secondary vertex fit), obtained from impactParameterTagInfos and secondaryVertexTagInfos
combinedSecondaryVertexMVABJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the impactParameterTagInfos and secondaryVertexTagInfos with an uptodate calibration from the the CMS conditions database, using a neural network instead of a likelihood ratio in case an actual secondary vertex was reconstructed

CMSSW\_1\_6\_x More [▢](#) CMSSW\_1\_6\_x Less [▾](#)

InputTag/Module (Instance name)	Containers	Description
<b><i>b-tag collections (in RECO and AOD)</i></b>		
btagSoftElectrons	reco::Electron <a href="#">(lxr)</a> <a href="#">(cvs)</a>	Electron candidates identified by the dedicated btagging SoftElectronProducer <a href="#">(lxr)</a> , <a href="#">(cvs)</a>

		starting from reco::Tracks <a href="#">↗</a>
softElectronTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft electron dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft electron in the jet
softMuonTagInfos	reco::SoftLeptonTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	soft muon dedicated TagInfo, containing informations used to b-tag jets due to the presence of a soft muon in the jet
softElectronJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftElectronTagInfo and the default soft electron tagger, which uses a neural network to combine most electron properties to improve rejection of non-b jets
softMuonJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties to improve rejection of non-b jets
softMuonNoIPJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	results of b-tagging a jet using the SoftMuonTagInfo and the default soft muon tagger, which uses a neural network to combine most muon properties except the impact parameter to improve rejection of non-b jets
impactParameterTagInfos	reco::TrackIPTagInfo <a href="#">↗</a>	contains information used for btagging about track properties such as impact parameters, decay len, probability to originate from th primary vertex.
jetProbabilityJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	result of jetProbability algorithm(based on TrackIPTagInfo).
trackCountingHighPurJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of track counting algorithm (requiring <b>three</b> tracks to have a significance above the discriminator). To be used for high purity selection (B eff < 50%, mistag rate < 1% )
trackCountingHighEffJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of track counting algorithm (requiring <b>two</b> tracks to have a significance above the discriminator). To be used for high efficiency selection (B eff > 50%, mistag rate > 1% )
impactParameterMVAJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the TrackIPTagInfos with an up-to-date calibration from the the CMS conditions database, making use of more general multivariate analysis techniques, like neural networks
combinedSVTagInfos	reco::CombinedSVTagInfo <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	contains a list of tagging variables containing information about track impact parameters and results from an attempted secondary vertex fit
combinedSVJetTags	reco::JetTag <a href="#">↗</a> (lxr <a href="#">↗</a> cvs <a href="#">↗</a> )	Result of application of a likelihood estimator to the tagging variables for the



		three possible algorithm outcomes (tracks only, pseudo vertex from at least two tracks or successful secondary vertex fit)
combinedSVMVAJetTags	reco::JetTag <a href="#">(lxr)</a> <a href="#">(cvs)</a>	uses the PhysicsTools/MVAComputer framework to compute a discriminator from the CombinedSVTagInfos with an uptodate calibration from the the CMS conditions database, making use of more general multivariate analysis techniques, like neural networks

## Review status

Reviewer/Editor and Date (copy from screen)	Comments
JyothsnaK - 25-May-2010	Updated the contents for CMSSW 3_0_X and CMSSW_3_6_X
KatiLassilaPerini - 25 May 2007	created template page

Responsible: Andrea Rizzi, Thomas Speer  
 Last reviewed by: JyothsnaK - 26-May-2010

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This topic: CMSPublic > SWGuideDataFormatRecoBTag  
 Topic revision: r17 - 2010-05-26 - JyothsnaK



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