# Document Overview

 This document is a checklist of items that should be included in an analysis note. The two anticipated types of analyses are cross sections and polarization observables. The document is organized with tables with columns for the page number where the item can be found and for any optional comments from the authors. Most items require description and sample figures. Some items are not necessary depending on what type of observable is being extracted.

 It is the expectation that the authors will include all items in their analysis note. The purpose is to streamline the review process and avoid delays if a standard item has been omitted. If the authors feel that some items should be excluded, they should give the justification in the Comments column. The working group chair will review the checklist and form a review committee after it has been shown that the standard items are in the analysis note.

# Type 1: Cross Section Analysis Note

Table 1: Introduction

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| Short overview of what is being analyzed and why |  |  |
| Short description of data set used (run period) |  |  |
| Trigger |  |  |
| Run conditions (if “non-standard”) |  |  |
| Special analysis conditions |  |  |
| Skimming |  |  |

Table 2: Cut Overview

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Electron Beam Experiment** |
| Calorimeter cuts - Sampling fraction |  |  |
| Calorimeter cuts – Min. ionizing pion cut |  |  |
| Calorimeter cuts – EC Total |  |  |
| Calorimeter cuts – Trigger threshold |  |  |
| Electron vertex cuts |  |  |
| Calorimeter fiducial cuts |  |  |
| Geometrical fiducial cuts |  |  |
| Cherenkov efficiency cuts |  |  |
| **Photon Beam Experiment** |
| Photon flux |  |  |
| Timing cuts |  |  |

Table 3: Hadron Identification. Should include description of kinematic fitting (if used).

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Detected Hadron Identification** |
| PID cuts |  |  |
| Vertex cuts |  |  |
| Geometrical fiducial cuts |  |  |
| **Reconstructed Hadron Identification** |
| Missing mass or invariant mass reconstruction and cuts |  |  |
| **Kinematic Corrections** |
| Momentum corrections (show effects) |  |  |
| Energy loss corrections (show effects) |  |  |
| Summary table showing the effects of cuts on yield |  |  |

Table 4: Differential Cross Section Extraction

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| Kinematic binning |  |  |
| **Raw Yield Extraction** |
| Peak fitting procedure and background identification procedures |  |  |
| Empty target subtraction |  |  |
| Statistical uncertainty calculation (This varies depending on the procedure for extraction and needs to be clearly shown.) |  |  |
| **Acceptance Corrections** |
| Reaction model used |  |  |
| List of dead detectors (could be in appendix) |  |  |
| Comparisons of detected yields and MC yields |  |  |
| List any acceptance cuts used |  |  |
| Acceptance and acceptance uncertainty calculation (Seems trivial but an unbelievably large number of analyses do the uncertainty incorrectly—people don’t use binomial uncertainty) |  |  |
| **Other Corrections and Normalizations** |
| Cherenkov efficiency correction |  |  |
| Radiative corrections |  |  |
| Finite bin-size and/or bin-centering corrections |  |  |
| Flux factor |  |  |
| Target thickness |  |  |
| Normalization to elastic scattering (if applicable) |  |  |
| Description of error propagation |  |  |

Table 5: Physics Results

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Total Cross Section (if applicable)** |
| Fits of differential cross sections |  |  |
| **Structure Function Extraction (if applicable)** |
| Fits of differential cross sections |  |  |
| **Systematic Uncertainties** |
| Describe any overall procedures. For example, one may vary the cuts to determine systematic uncertainties. Describe how the differences between nominal and varied cuts are used to estimate the systematic uncertainty. Are statistical uncertainties disentangled?  |  |  |
| There should be an entry for every item in Table 4. These should be broken down into point-to-point and scale-type uncertainties and an overall uncertainty should be determined. |  |  |
| Total cross section/structure function uncertainty. Extrapolations into kinematic regions outside of the acceptance require assumptions. Describe how changing these assumptions affect results. |  |  |
| Describe any cross checks such as sector dependence |  |  |
| **Final Results** |
| Figures of all final results |  |  |
| Tables of all final results |  |  |
| Description of results to be published and physics conclusions to be drawn from these results |  |  |

# Type 2: Polarization Observable Analysis Note

Table 6: Introduction

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| Short overview of what is being analyzed and why |  |  |
| Short description of data set used (run period) |  |  |
| Trigger |  |  |
| Run conditions (if “non-standard”) |  |  |
| Special analysis conditions |  |  |
| Skimming |  |  |
| Beam Polarization. Describe what type of polarization the beam has and how it is measured.  |  |  |

Table 7: Cut Overview

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Electron Beam Experiment** |
| Calorimeter cuts - Sampling fraction |  |  |
| Calorimeter cuts – Min. ionizing pion cut |  |  |
| Calorimeter cuts – EC Total |  |  |
| Calorimeter cuts – Trigger threshold |  |  |
| Electron vertex cuts |  |  |
| Calorimeter fiducial cuts |  |  |
| Geometrical fiducial cuts |  |  |
| Cherenkov efficiency cuts |  |  |
| **Photon Beam Experiment** |
| Photon flux |  |  |
| Timing cuts |  |  |

Table 8: Hadron Identification. Should include description of kinematic fitting (if used).

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Detected Hadron Identification** |
| PID cuts |  |  |
| Vertex cuts |  |  |
| Geometrical fiducial cuts |  |  |
| **Reconstructed Hadron Identification** |
| Missing mass or invariant mass reconstruction and cuts |  |  |
| **Kinematic Corrections** |
| Momentum corrections (show effects) |  |  |
| Energy loss corrections (show effects) |  |  |
| Summary table showing the effects of cuts on yield |  |  |

Table 9: Yield Extraction

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| Kinematic binning |  |  |
| **Raw Yield Extraction** |
| Peak fitting procedure and background identification procedures |  |  |
| Empty target subtraction |  |  |
| Statistical uncertainty calculation (This varies depending on the procedure for extraction and needs to be clearly shown.) |  |  |
| **Acceptance Corrections** |
| Reaction model used |  |  |
| List of dead detectors (could be in appendix) |  |  |
| Comparisons of detected yields and MC yields |  |  |
| List any acceptance cuts used |  |  |
| Acceptance and acceptance uncertainty calculation (Seems trivial but an unbelievably large number of analyses do the uncertainty incorrectly—people don’t use binomial uncertainty) |  |  |
| **Other Corrections and Normalizations** |
| Cherenkov efficiency correction |  |  |
| Radiative corrections |  |  |
| Finite bin-size and/or bin-centering corrections |  |  |
| Description of error propagation |  |  |

Table 10: Physics Results

|  |  |  |
| --- | --- | --- |
| **Item** | **Page #’s** | **Comments** |
| **Polarization Observable Extraction** |
| Description of how polarization observable is extracted from the yields |  |  |
| Uncertainty calculation |  |  |
| **Systematic Uncertainties** |
| Describe any overall procedures. For example, one may vary the cuts to determine systematic uncertainties. Describe how the differences between nominal and varied cuts are used to estimate the systematic uncertainty. Are statistical uncertainties disentangled?  |  |  |
| Beam polarization uncertainty |  |  |
| There should be an entry for every item in Table 9. These should be broken down into point-to-point and scale-type uncertainties and an overall uncertainty should be determined. |  |  |
| Total uncertainty. Extrapolations into kinematic regions outside of the acceptance require assumptions. Describe how changing these assumptions affect results. |  |  |
| **Final Results** |
| Figures of all final results |  |  |
| Tables of all final results |  |  |
| Description of results to be published and physics conclusions to be drawn from these results |  |  |