Operator(s): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Experiment: \_\_ATLAS \_\_CMS

Materials needed: internet-connected computer, protractor (or protractor plug-in or app)

Tallies for angles **ϕ1** and **ϕ2** (measure and place tick mark for each near the closest angle):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Angle (degrees)** | **Tick marks** |  | **Angle (degrees)** | **Tick marks** |
|  10 |  |  | 190 |  |
|  30 |  |  | 210 |  |
|  50 |  |  | 230 |  |
|  70 |  |  | 250 |  |
|  90 |  |  | 270 |  |
| 110 |  |  | 290 |  |
| 130 |  |  | 310 |  |
| 150 |  |  | 330 |  |
| 170 |  |  | 350 |  |

Tallies for opening angle ΔΦ (calculate and place tick mark near the closest angle):

|  |  |
| --- | --- |
| **Angle (degrees)** | **Tick marks** |
|  10 |  |
|  30 |  |
|  50 |  |
|  70 |  |
|  90 |  |
| 110 |  |
| 130 |  |
| 150 |  |
| 170 |  |

**Make histograms from your own data!**

PHI (ϕ1 and ϕ2):



Delta-PHI (ΔΦ):



**Angles measured:**

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