

Seed Filter and Seed Confirmation

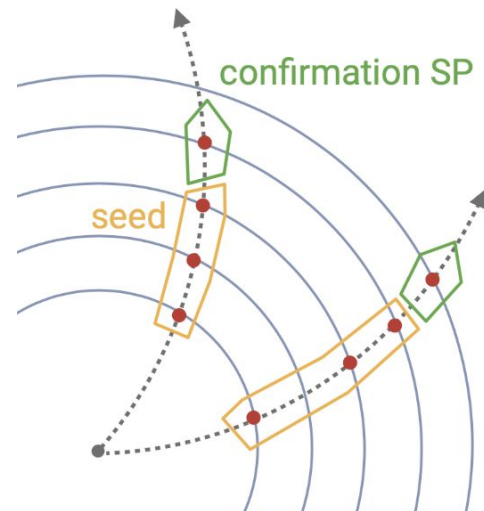
After selecting the SP-triplets, a seed filter/confirmation procedure is applied to all the triplet combinations to **rank the seeds based on a weight** and keep only the best seeds:

$$w = -c_1 \cdot d_0 + (c_2 \cdot N_t - |z_0|)$$

Seeds can also be classified as higher quality seeds if they have specific values of d_0 , z_0 and N_t inside a configurable range of parameters that also depends on the region of the detector (i.e. forward or central region)

```
struct SeedConfirmationRangeConfig {  
    // z minimum and maximum of middle component of the seed used to define the  
    // region of the detector for seed confirmation  
    float zMinSeedConf =  
        std::numeric_limits<float>::min(); // Acts::UnitConstants::mm  
    float zMaxSeedConf =  
        std::numeric_limits<float>::max(); // Acts::UnitConstants::mm  
    // radius of bottom component of seed that is used to define the number of  
    // compatible top required
```

```
    float rMaxSeedConf =  
        std::numeric_limits<float>::max(); // Acts::UnitConstants::mm  
    // number of compatible top SPs of seed if bottom radius is larger than  
    // rMaxSeedConf  
    size_t nTopForLargeR = 0;  
    // number of compatible top SPs of seed if bottom radius is smaller than  
    // rMaxSeedConf  
    size_t nTopForSmallR = 0;
```



Seed Filter and Seed Confirmation

```
seedConfirmation = True
```

```
centralSeedConfirmationRange = acts.SeedConfirmationRangeConfig(
```

```
zMinSeedConf=-250 * u.mm,
```

```
zMaxSeedConf=250 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
) # contains parameters for seed confirmation
```

```
forwardSeedConfirmationRange = acts.SeedConfirmationRangeConfig(
```

```
zMinSeedConf=-3000 * u.mm,
```

```
zMaxSeedConf=3000 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
)
```

Used to divide the the two seed confirmation regions (central and forward)

Used in the calculation of the weight for each regions

Seed Filter and Seed Confirmation

```
centralSeedConfirmationRange = acts.SeedConfirmationRang
```

```
zMinSeedConf=-250 * u.mm,
```

```
zMaxSeedConf=250 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
) # contains parameters for seed confirmation
```

```
forwardSeedConfirmationRange = acts.SeedConfirmationRang
```

```
zMinSeedConf=-3000 * u.mm,
```

```
zMaxSeedConf=3000 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

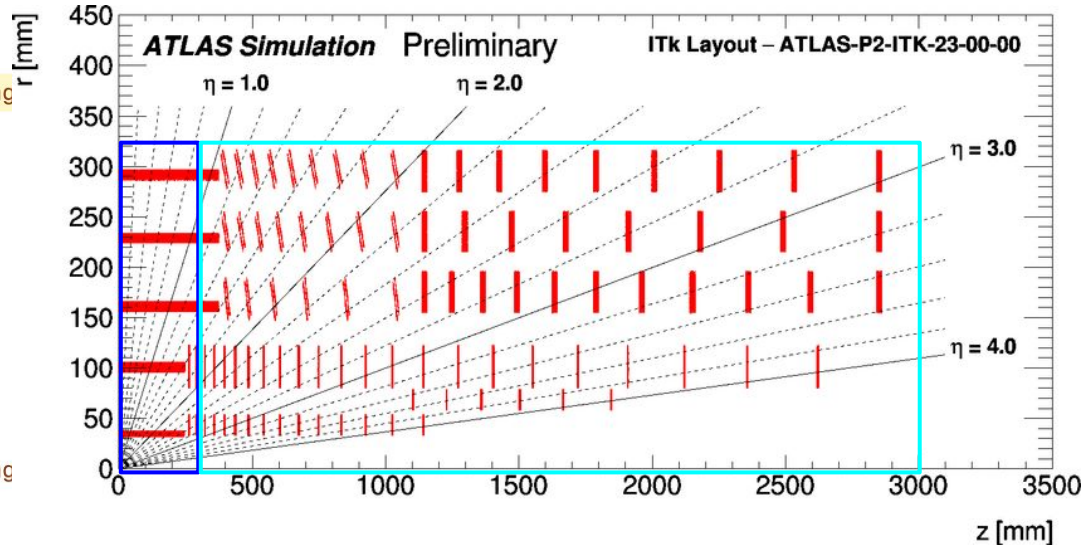
```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
)
```



Seed Filter and Seed Confirmation

```
centralSeedConfirmationRange = acts.SeedConfirmationRang
```

```
zMinSeedConf=-250 * u.mm,
```

```
zMaxSeedConf=250 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
) # contains parameters for seed confirmation
```

```
forwardSeedConfirmationRange = acts.SeedConfirmationRang
```

```
zMinSeedConf=-3000 * u.mm,
```

```
zMaxSeedConf=3000 * u.mm,
```

```
rMaxSeedConf=140 * u.mm,
```

```
nTopForLargeR=1,
```

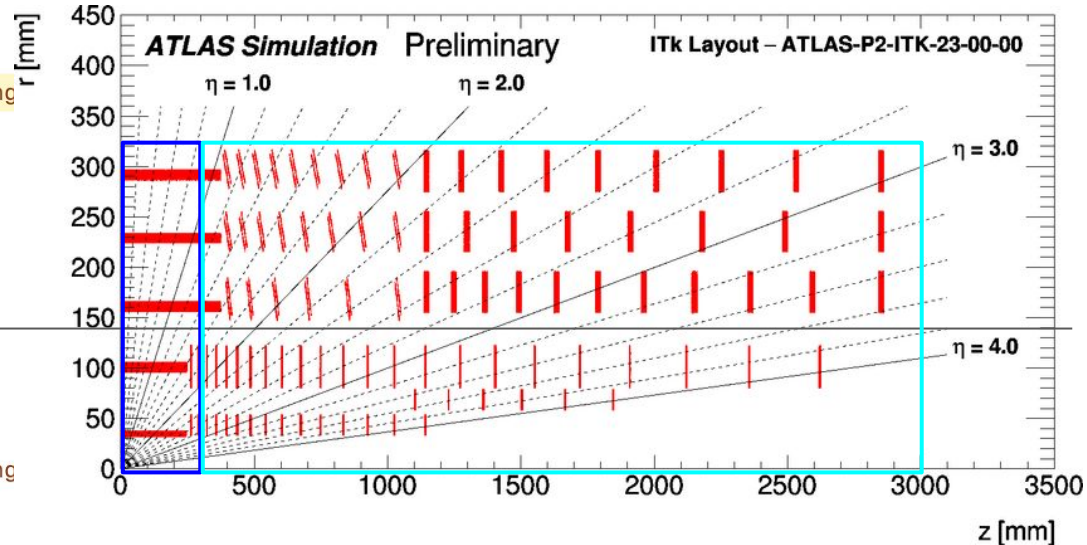
```
nTopForSmallR=2,
```

```
seedConfMinBottomRadius=60.0 * u.mm,
```

```
seedConfMaxZOrigin=150.0 * u.mm,
```

```
minImpactSeedConf=1.0 * u.mm,
```

```
)
```



Seed Filter and Seed Confirmation

