Define coupling factor, Insertion loss and directivity of directional coupler.

1. **Coupling Factor:** The coupling factor (often denoted as "C") of a directional coupler is a measure of how much signal power is coupled from one port to another. It is expressed in decibels (dB) and is a measure of the power ratio between the coupled port and the input port. The coupling factor can be either positive or negative. A positive coupling factor indicates power is coupled from the input port to the coupled port, while a negative coupling factor means power is coupled from the input port to the isolated port.
2. **Insertion Loss:** Insertion loss (often denoted as "IL") is a measure of the power loss that occurs when a signal passes through a directional coupler. It is expressed in decibels (dB) and quantifies the amount of power that is lost as the signal is split between the coupled and output ports. Lower insertion loss values are desirable because they indicate that less signal power is lost during coupling.
3. **Directivity:** Directivity is a measure of how effectively a directional coupler isolates the input port from the coupled port and the isolated port. It is also expressed in decibels (dB) and represents the ratio of power coupled from one port to the other compared to the power that is internally reflected back to the input port. A higher directivity value indicates better isolation, as it means that more power is directed towards the coupled or isolated port and less power is reflected back to the input port.