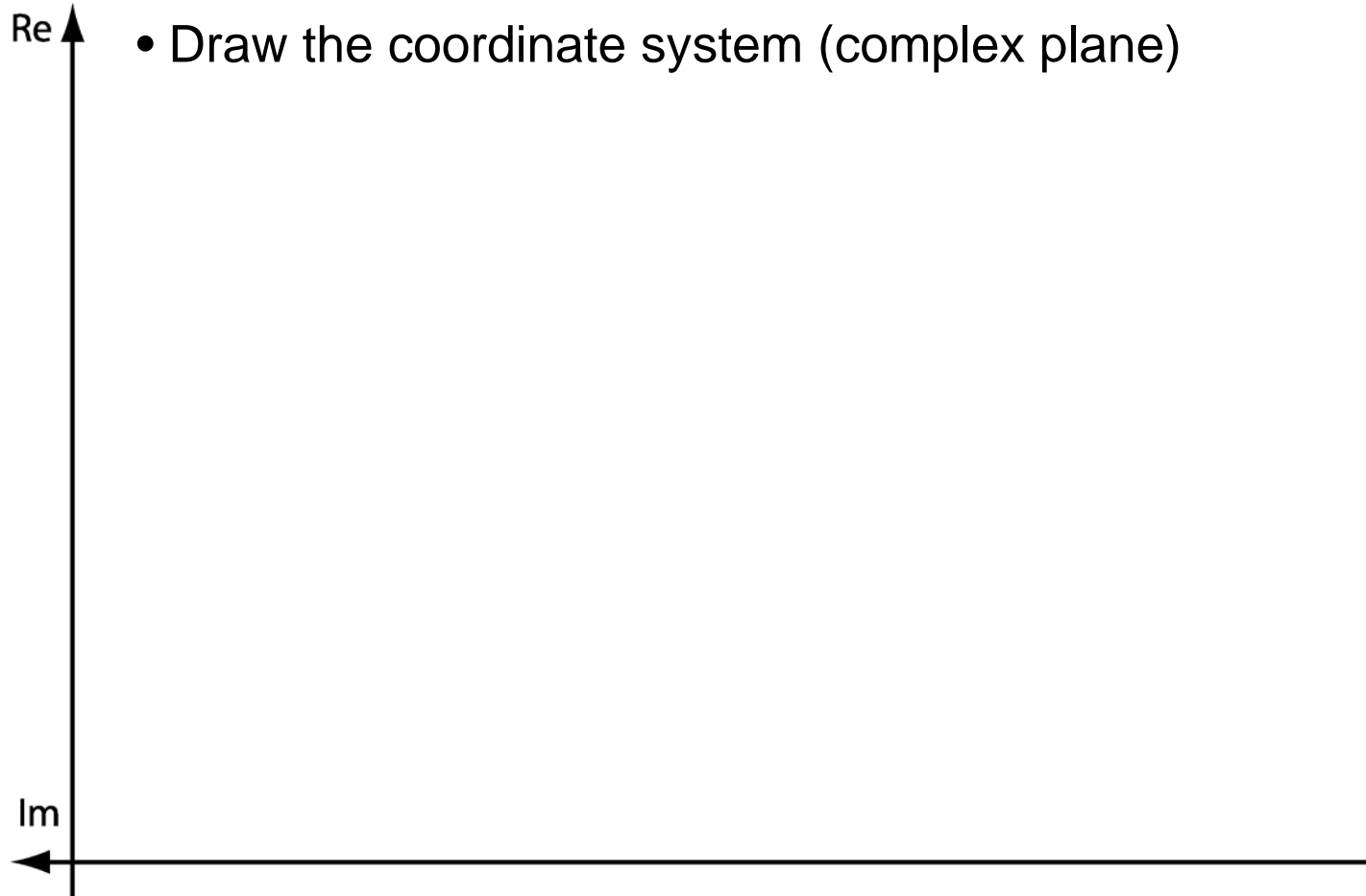


# EMD Tutorial 5: Construction of the OSSANNA-circle

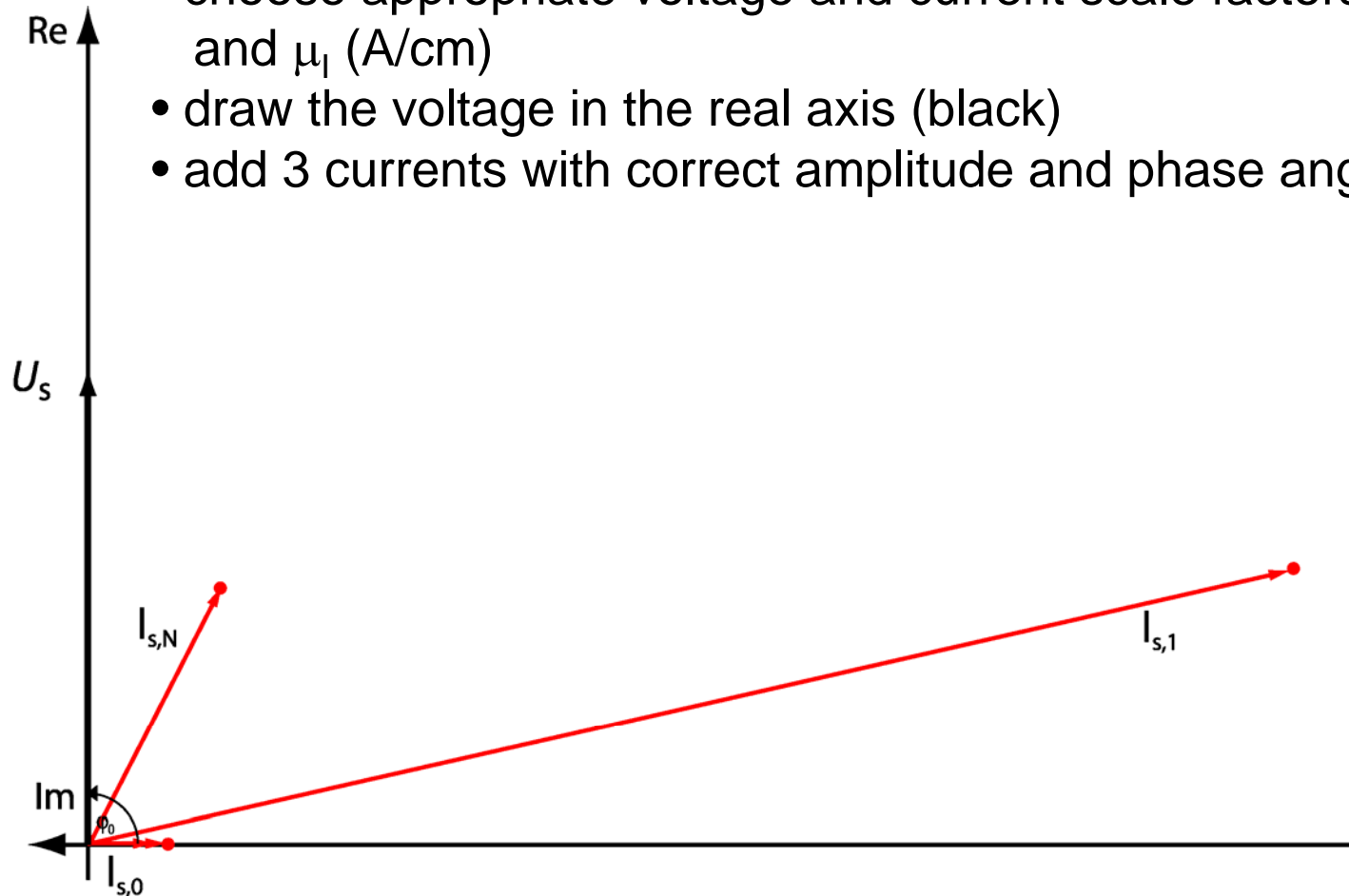
Step 1



# EMD Tutorial 5: Construction of the OSSANNA-circle

## Step 2

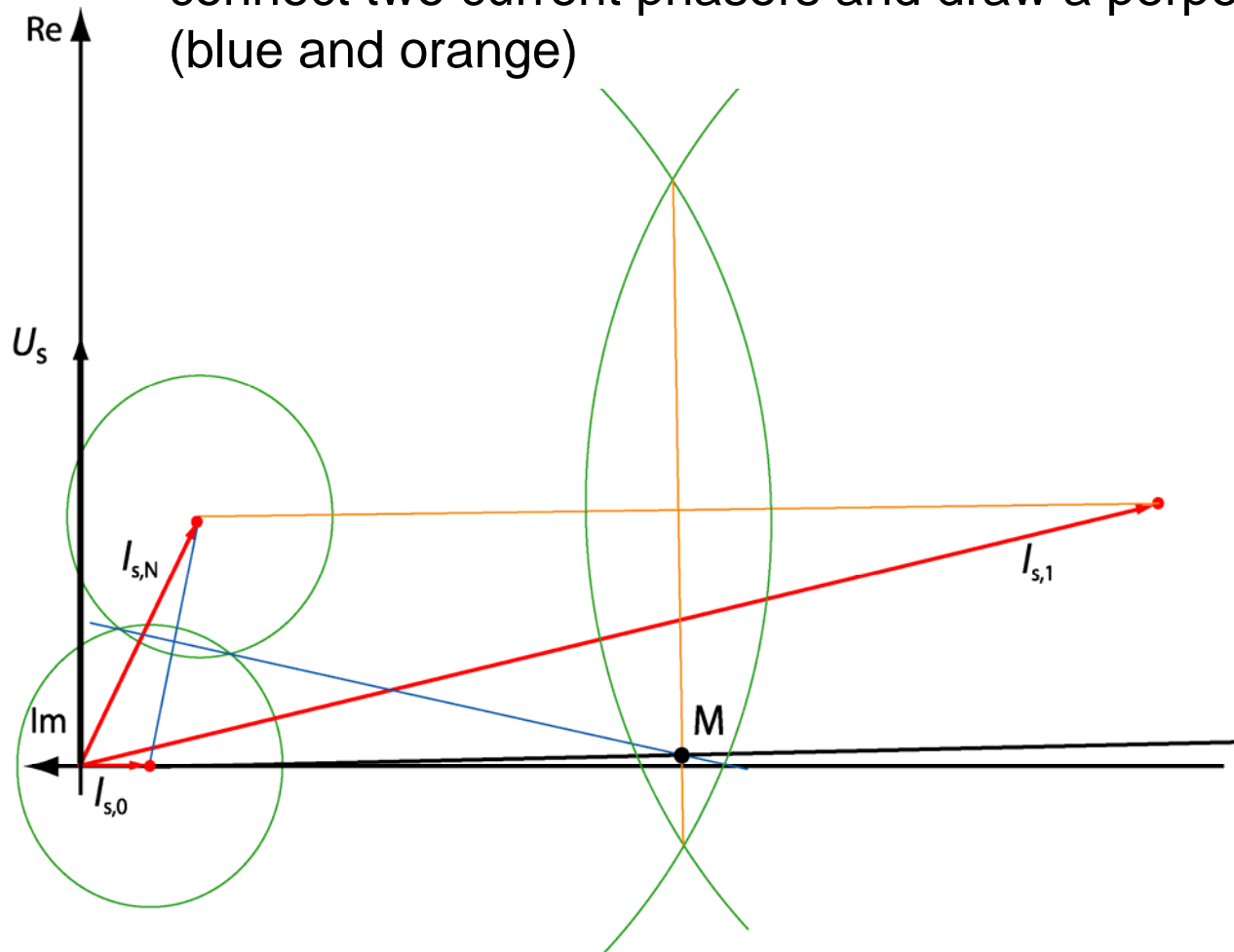
- choose appropriate voltage and current scale factors  $\mu_U$  (V/cm) and  $\mu_I$  (A/cm)
- draw the voltage in the real axis (black)
- add 3 currents with correct amplitude and phase angle (red)



# EMD Tutorial 5: Construction of the OSSANNA-circle

## Step 3

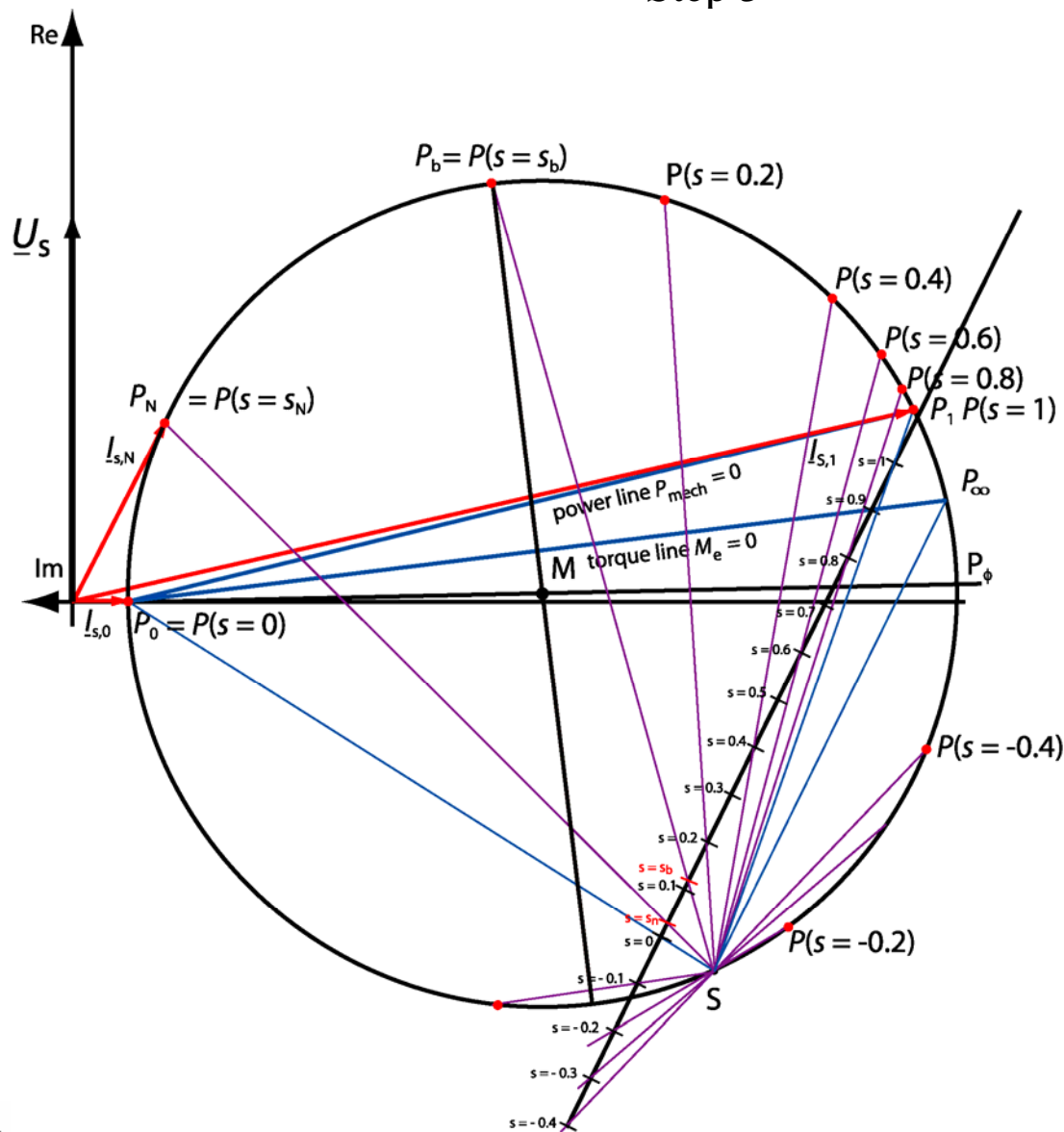
- knowing that the end points of all current phasors are on **ONE** circle, construct the centre of the circle **M**:  
connect two current phasors and draw a perpendicular bisector (blue and orange)





# EMD Tutorial 5: Construction of the OSSANNA-circle

Step 5

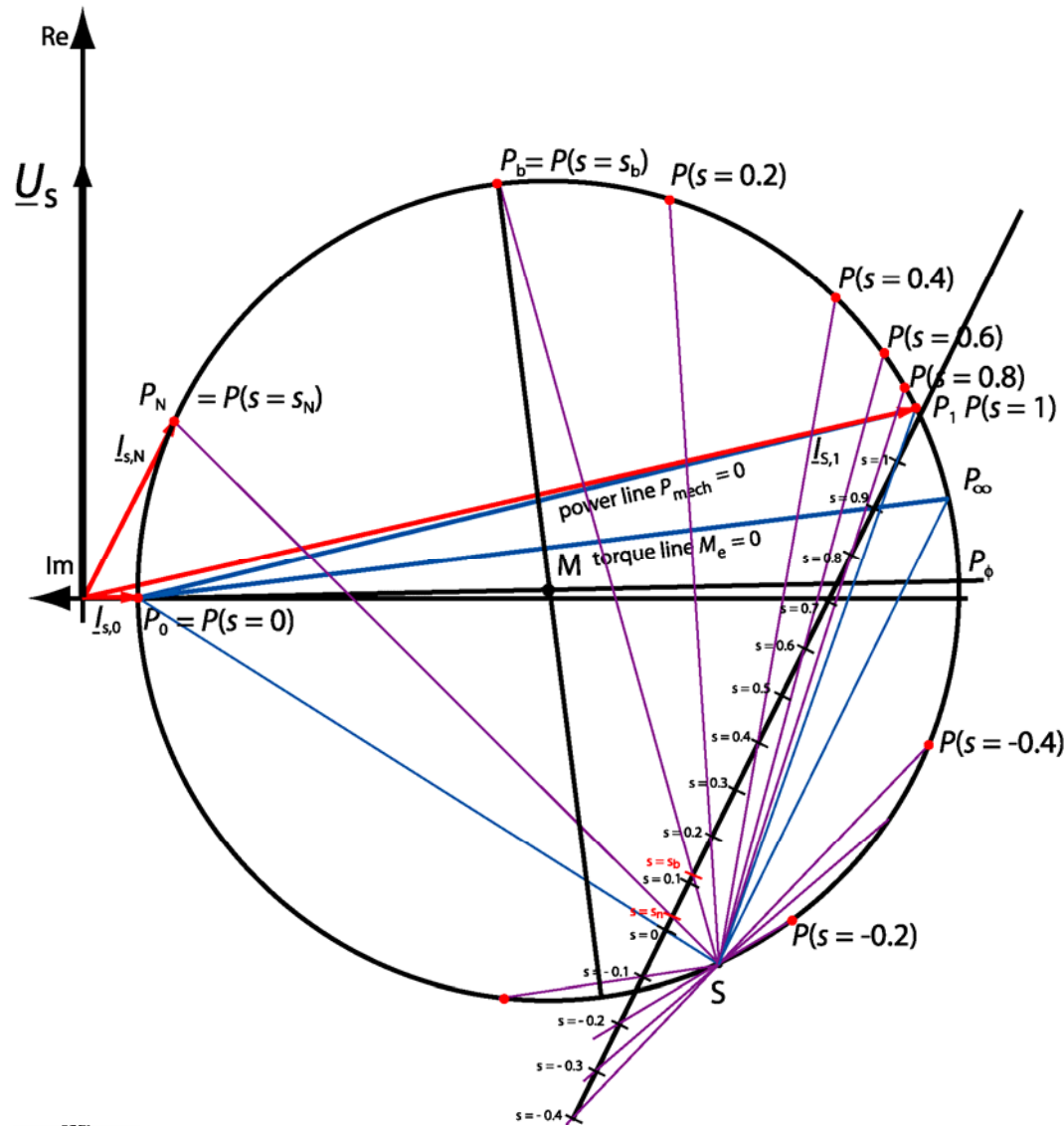


- choose an arbitrary point  $S$  to define a slip line
- Connect  $S$  and  $P_\infty$  and draw a second parallel line to it (**slip line**)
- Connect  $S$  with  $P_0$  and  $P_1$  and scale the slip line (linear)



# EMD Tutorial 5: Construction of the OSSANNA-circle

## Step 6



- you can now use the slip line to find any slip value on the circle diagram. Draw a straight line from S to any point on the circle. The intersection with the slip line will tell you the slip value corresponding to this point of operation

• **DONE !**

- Now you can read off many characteristic values such as power, torque, current, losses, etc. for any point of operation (see EMD textbook)  
→ Derivation of  $M(n)$  characteristic, etc.



# EMD Tutorial 5: Construction of the OSSANNA-circle

Step 7

Complete OSSANNA diagram  
(current locus diagram) after  
the construction

