1.

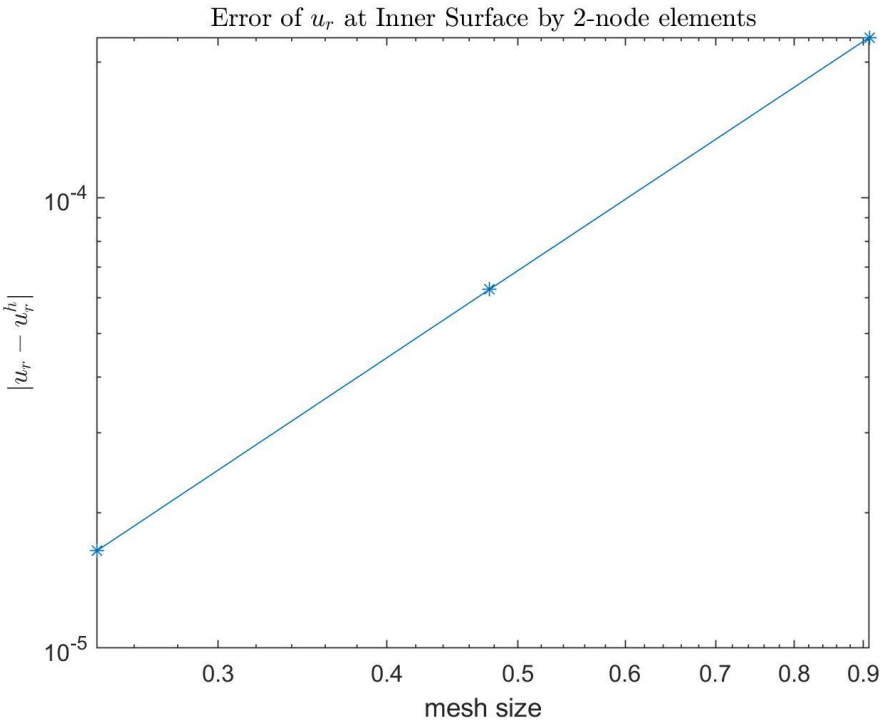

Fig1. Error of u_r at the inner surface, by 2 node linear element.

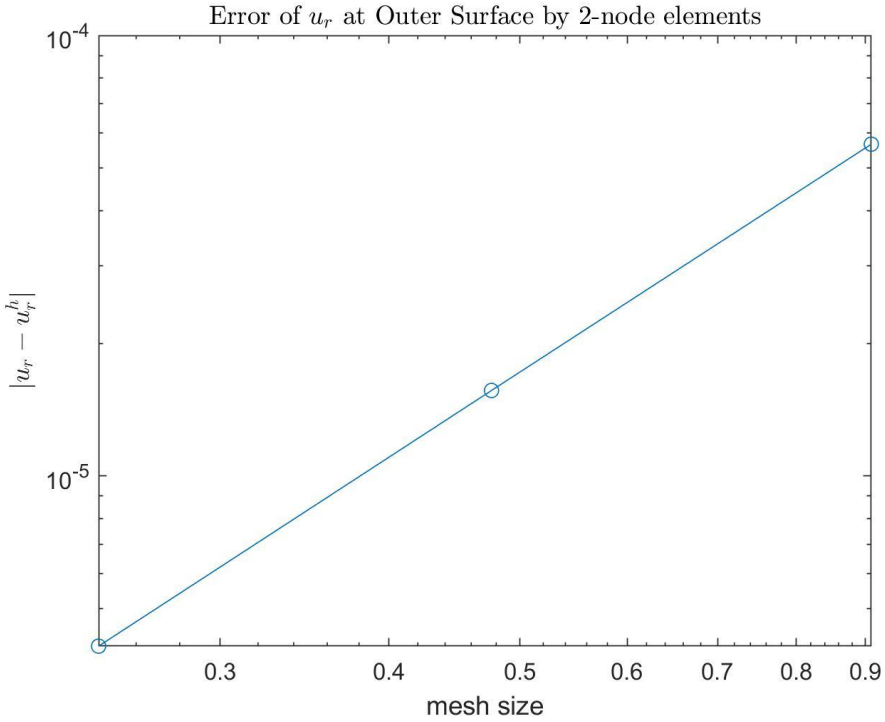

Fig2. Error of u_r at the outer surface, by 2 node linear element.

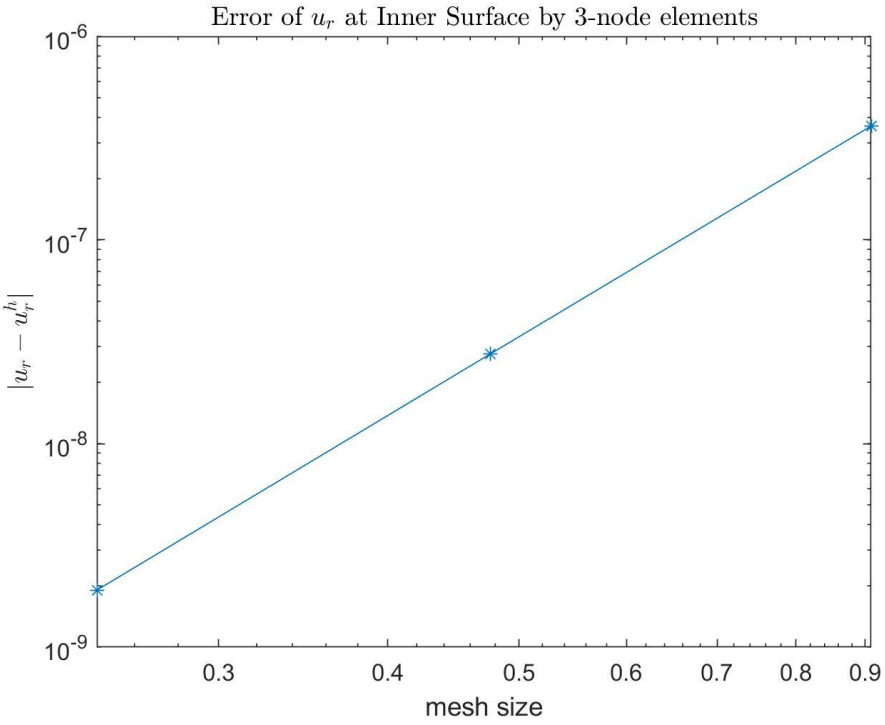

Fig3. Error of u_r at the inner surface, by 3 node linear element.

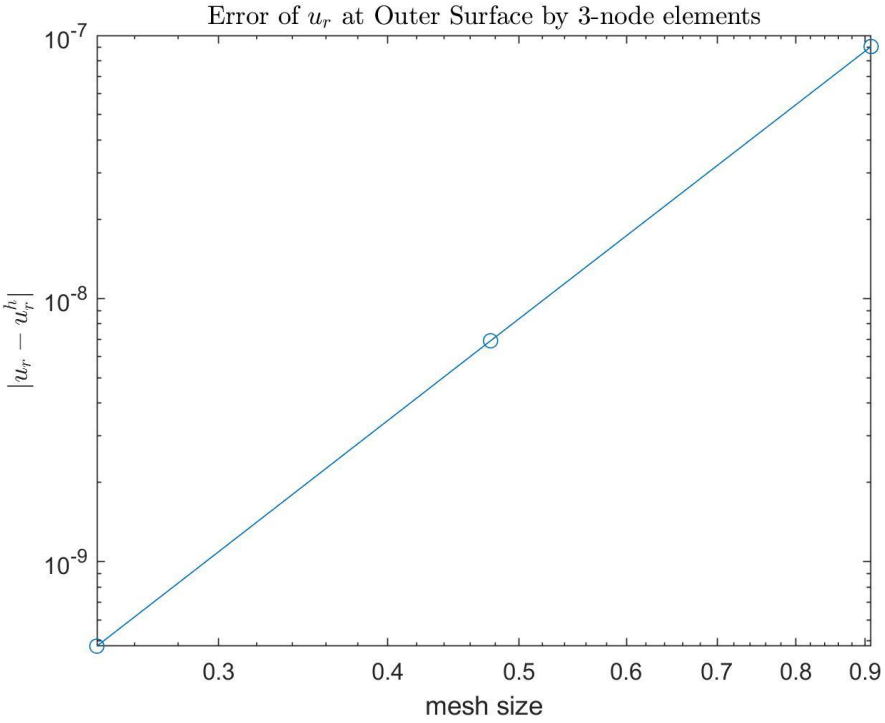

Fig4. Error of u_r at the inner surface, by 3 node linear element.

From the plots, it can be seen that the errors decrease as mesh refines.

For solution with 2 node linear element, error in displacement at inner surface and outer surface convergences at rate of 2.

For solution with 3 node quadratic elements, error in displacement at inner surface and outer surface convergences at rate of 4.

Compare absolute error of displacement at both inner and outer surface, solution given by 3 node elements is better than 2 node elements.

2.

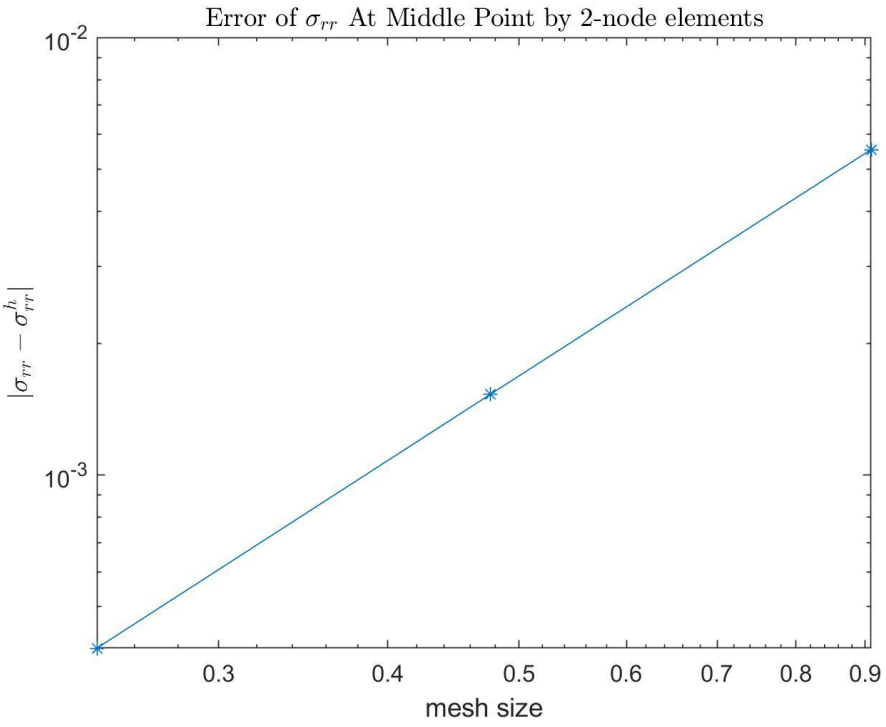

Fig5. Error of σ_{rr} at the inner surface, by 2 node linear element.

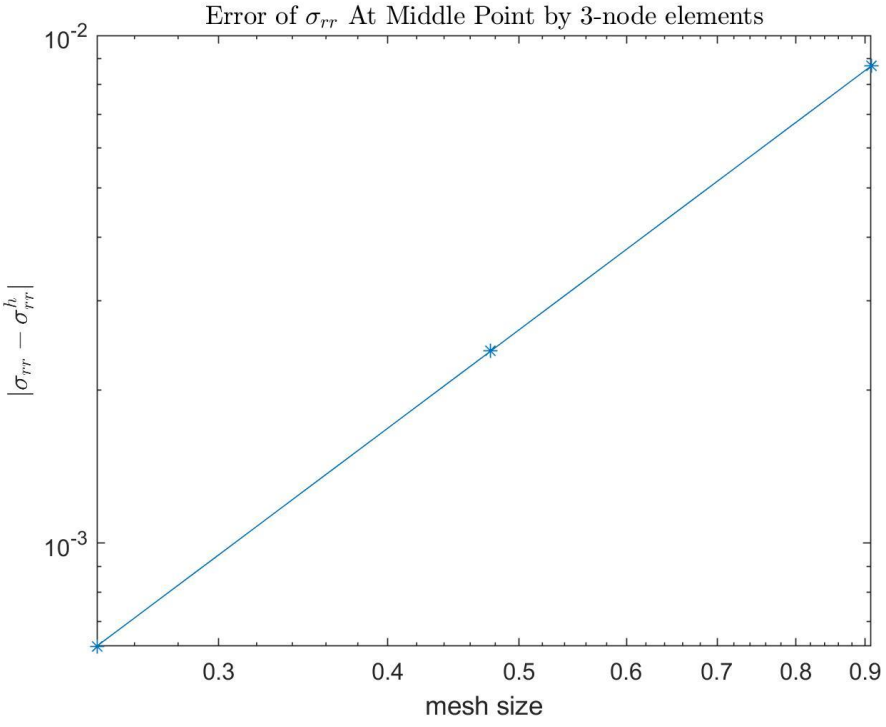

Fig6. Error of σ_{rr} at the inner surface, by 3 node linear element.

For radial stress, error by 2 node element and 3 node element both converges at the rate of 2, but at same order of magnitude.

3.

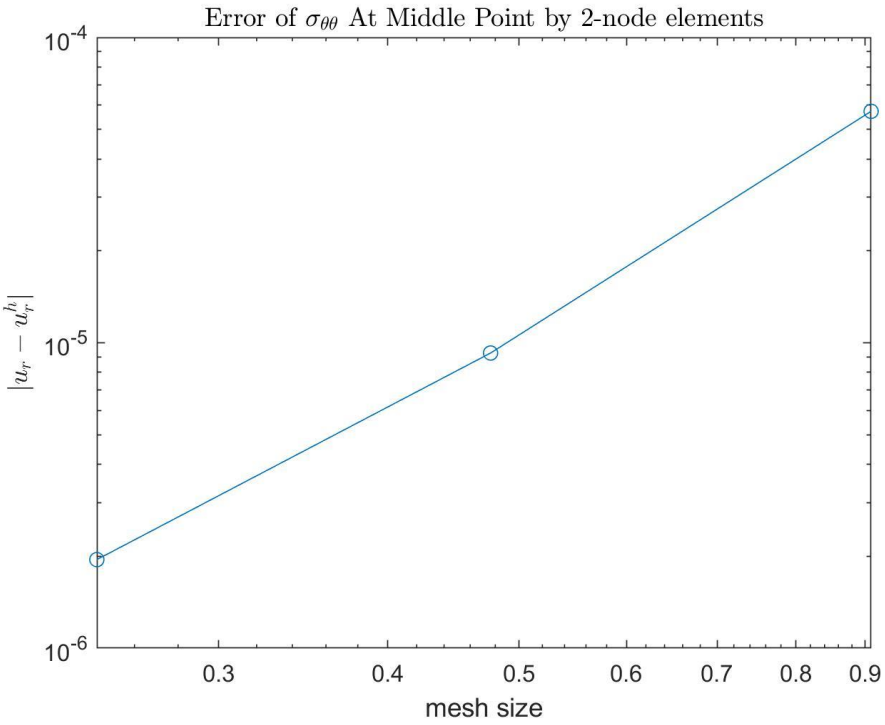

Fig7. Error of $\sigma_{\theta\theta}$ at the inner surface, by 2 node linear element.

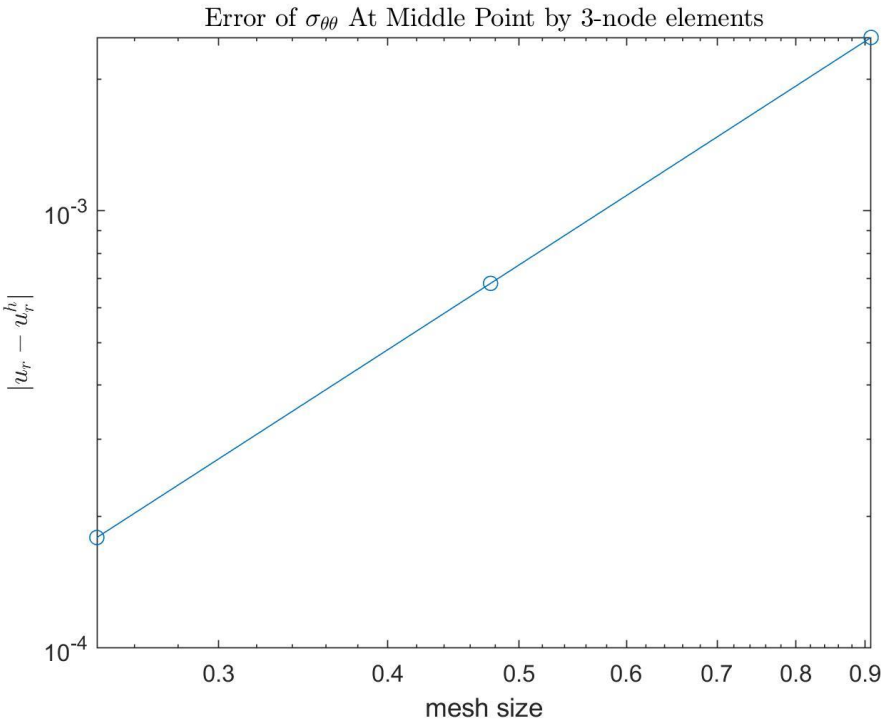

Fig6. Error of $\sigma_{\theta\theta}$ at the inner surface, by 3 node linear element.

For circumferential stress, the situation is same as radial stress, FEM solution given by 2 node elements and 3 node elements both converges at the rate of 2.