



Fig. 5. Stress analysis of 5mm diameter nozzle with two separated 45° apertures at tip by using three different types of materials; titanium (a), alloy steel (b) and silicon nitride (c)

IV. CONCLUSIONS

In conclusion, the preliminary analysis did not show any significant difference between the proposed materials. However this was based on axial stress which considered only the penetration. Further analysis will be considered in terms of torsion and also thin wall pressures due to the fluid flow in order to optimize the design.

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