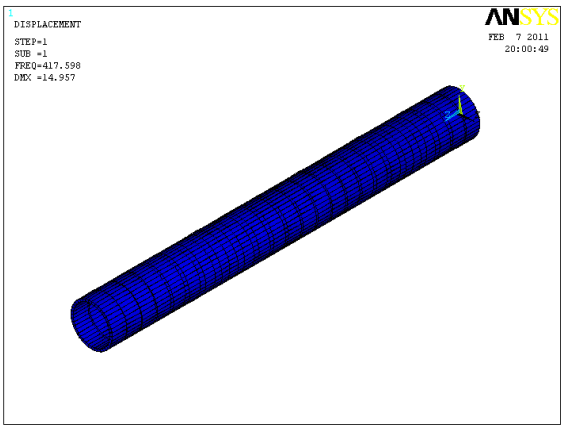

Figure 9: First shape of Aluminium

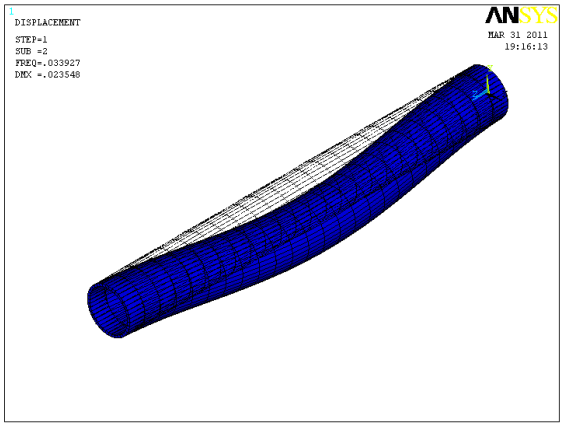

Figure 12: Second shape of Concrete

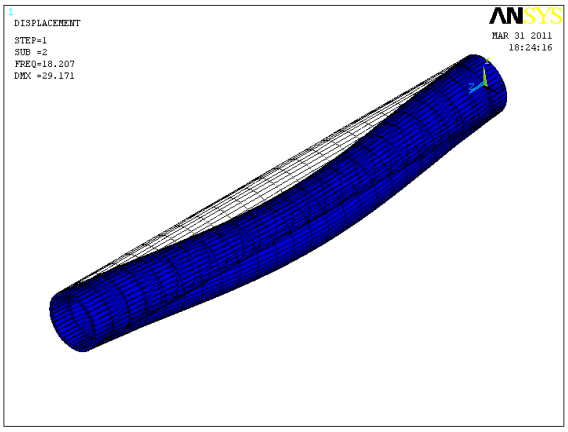

Figure 10: Second shape of PVC

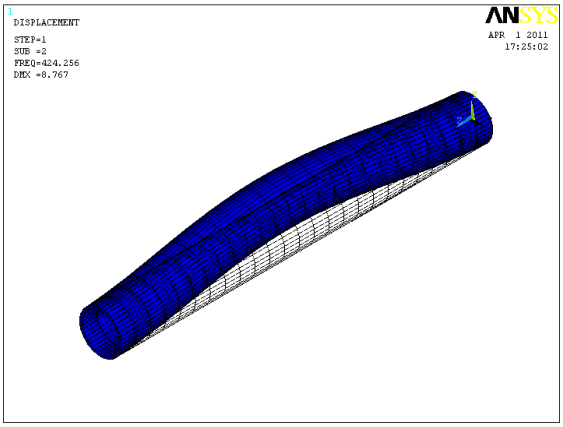

Figure 13: Second shape of Steel

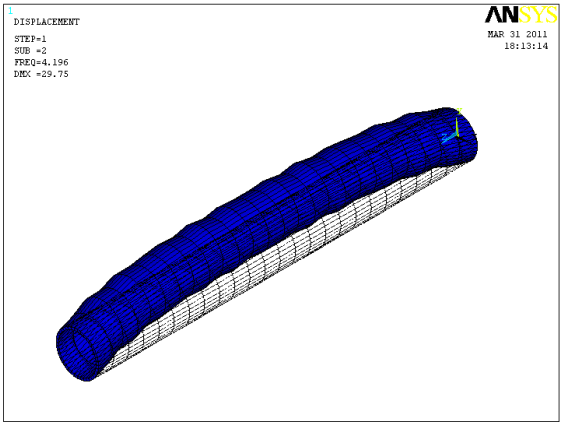

Figure 11: Second shape of Polyethylene

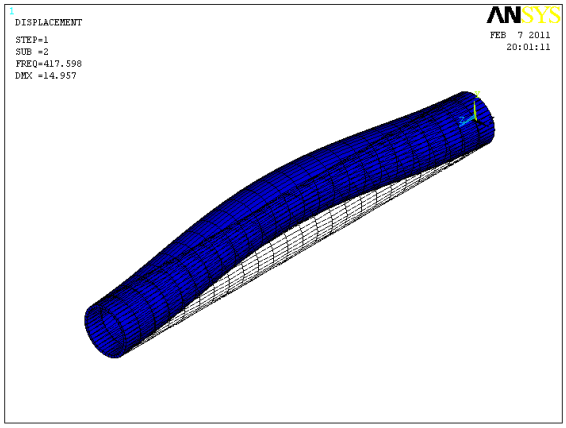

Figure 14: Second shape of Aluminium

5 Conclusion

In this paper a non-linear dynamic model for a pipe conveying fluid have presented. Moreover, a linearization method have been done by approximation of the non-linear system to the linear gyroscopic system. From the linear system, the stability of the pipe is analyzed in a general form by means of the first Lyapunov's methods. The stability generalization of the system have been done obtaining the stability limits as function of the material parameters.

In this paper the calculations and the simulation of typical materials for a pipe used in public works have been compared to verify the results obtained.

It have been shown that the dynamics and stability of pipes conveying fluid not only depends on the boundary conditions but it is also strongly important the material of the pipe and the pressure produced by the fluid.

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