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Flow-induced oscillations of a prism with triangular cross-section placed in water[1] DANIEL CARLSON, BANAFSHEH SEYED-AGHAZADEH, YAHYA MODARRES-SADEGHI, Univ of Mass - Amherst — Flow-induced oscillations of a prism with a triangular cross-section was studied experimentally. The cylinder had one-degree-of-freedom to oscillate in the crossflow direction. The response of the cylinder in terms of the amplitudes of oscillations as well as the flow forces were studied at varying angles of attack in the range of α =0° -60° and a reduced velocity range of U*=4-22. Depending on the angle of attack and the reduced velocity, the cylinder experienced either VIV or galloping. For small angles of attack of α<30°, the cylinder did not oscillate while for larger angles of α =30° and 35°, the cylinder underwent VIV in a range of reduced velocities (U*=7-14.5) and galloping at higher reduced velocities (U*=19.5-22). The conducted dye flow visualization as well as the measured flow forces confirmed the existence of lock-in as well as galloping-type response. For larger angles of attack of α>35°, the amplitude of oscillations increased monotonically with increasing reduced velocity and the cylinder underwent galloping. Several different vortex shedding patterns were observed in the wake of the cylinder at different angles of attack and flow velocities. New, high-frequency shedding patterns with their corresponding high harmonic shedding frequencies in the flow force FFTs were observed in the regions where galloping occurred.

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