

Fe based magnetostrictive alloy for flow, torque and bilge sediment sensors

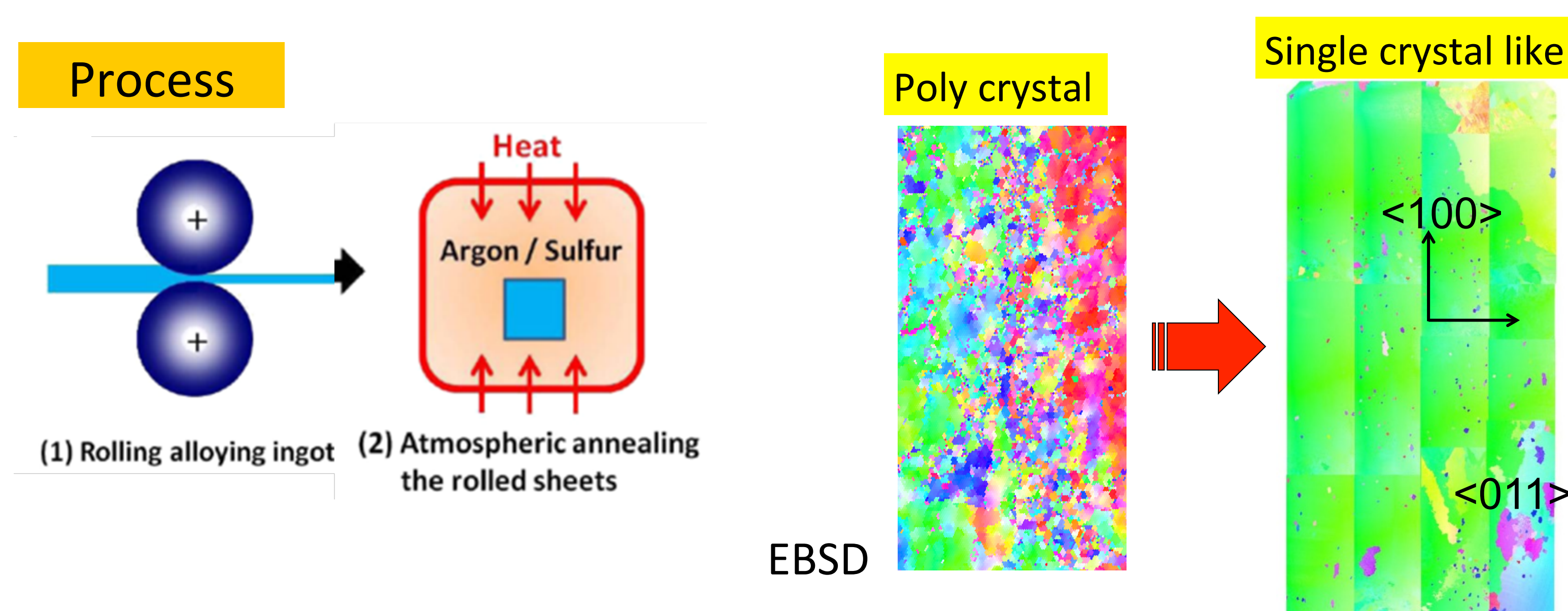
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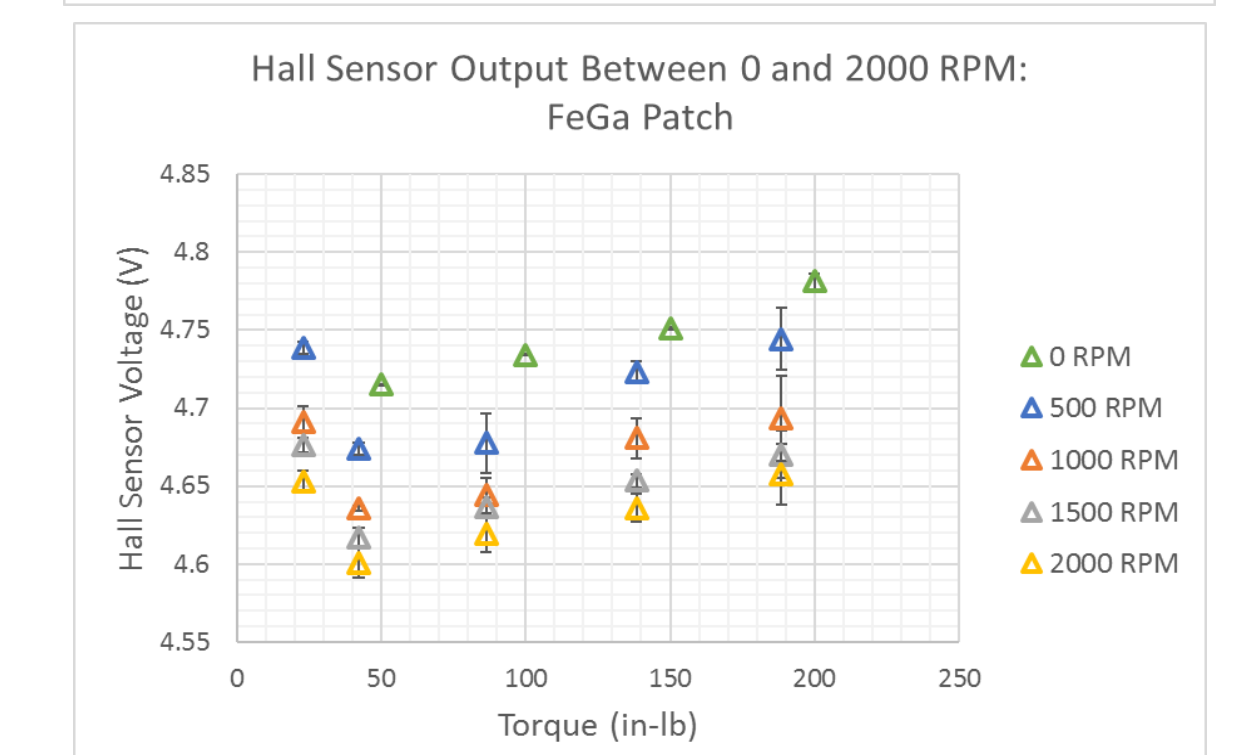
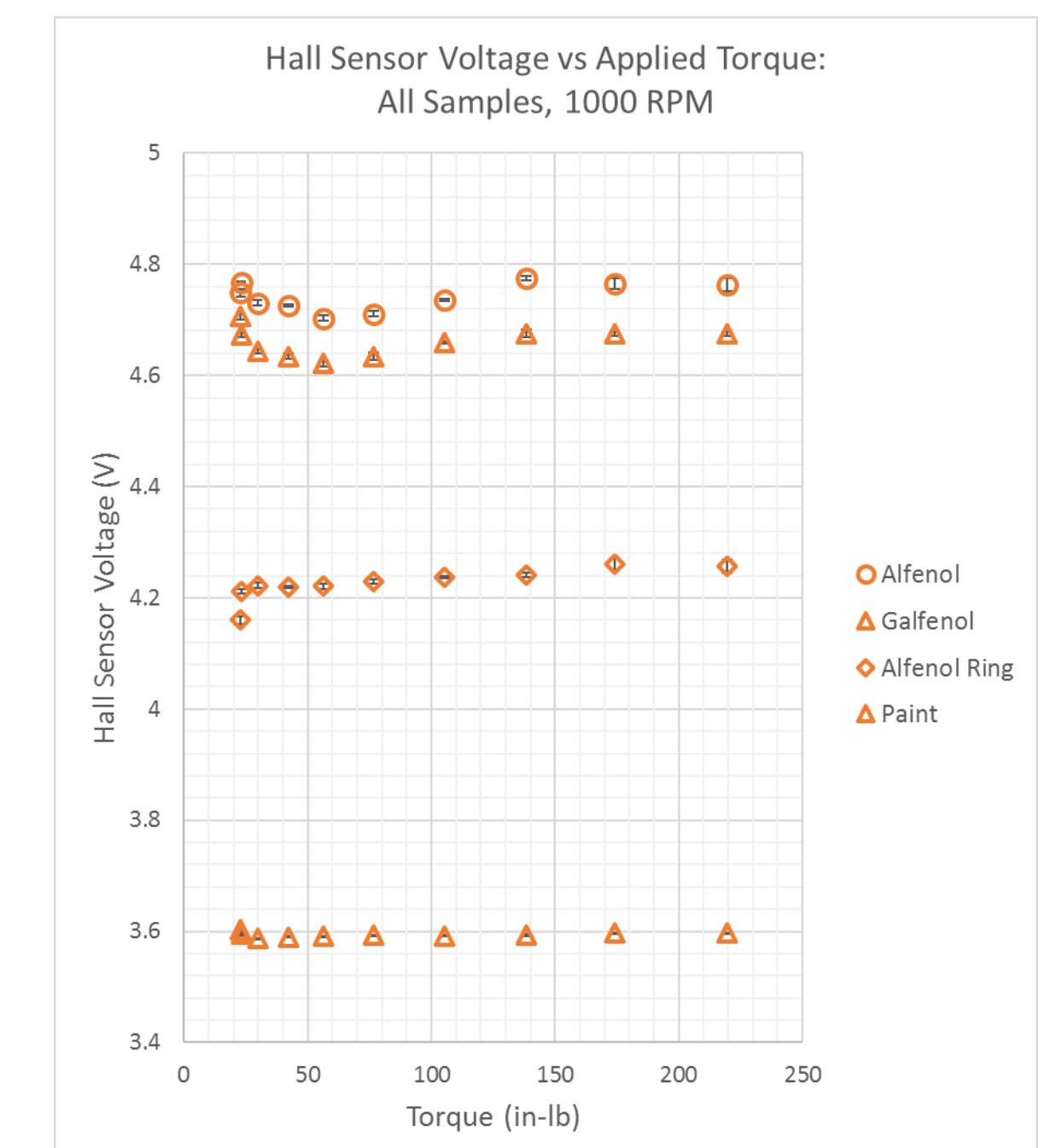
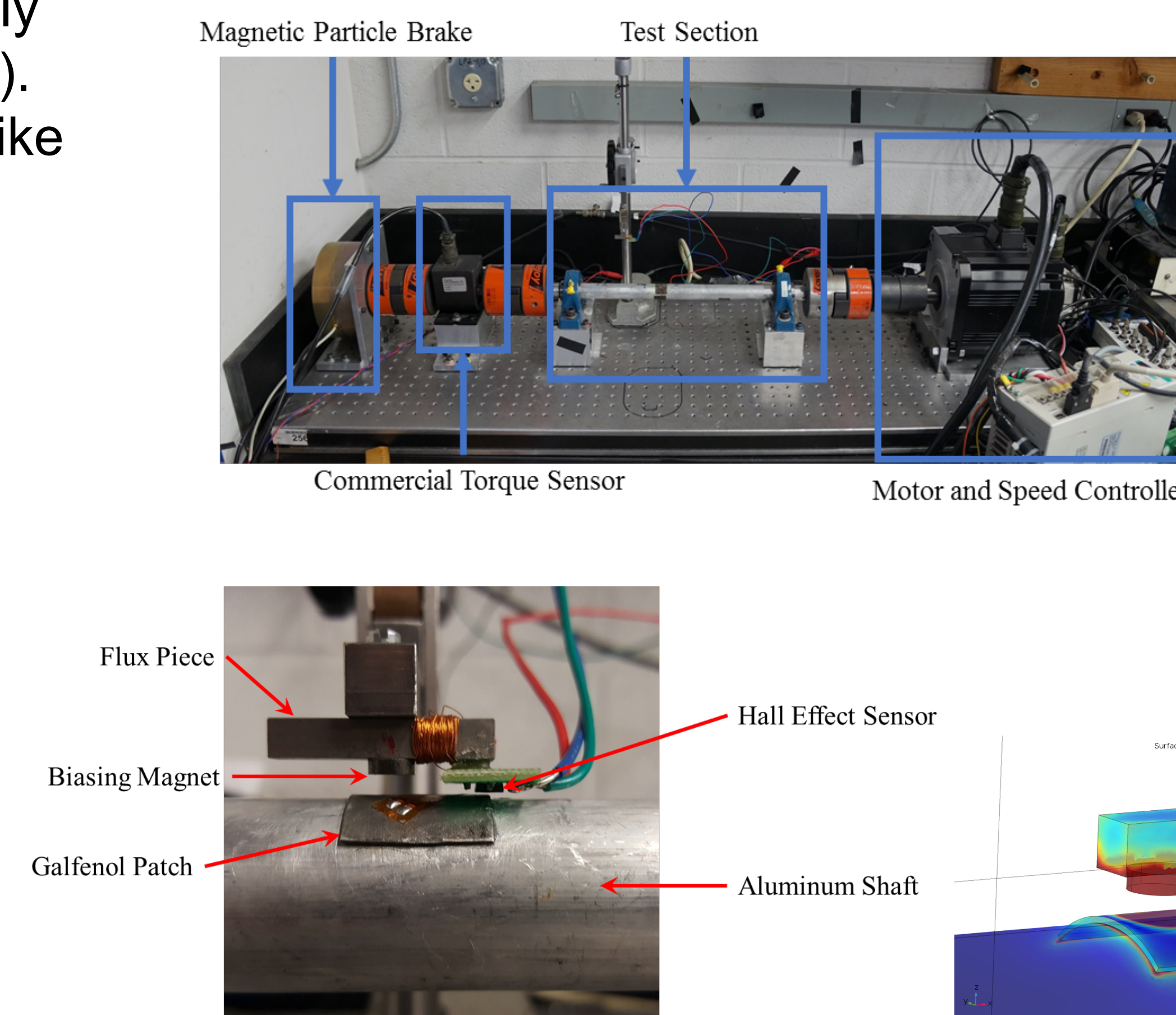
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Fe-Ga/Fe-Al rolled sheet

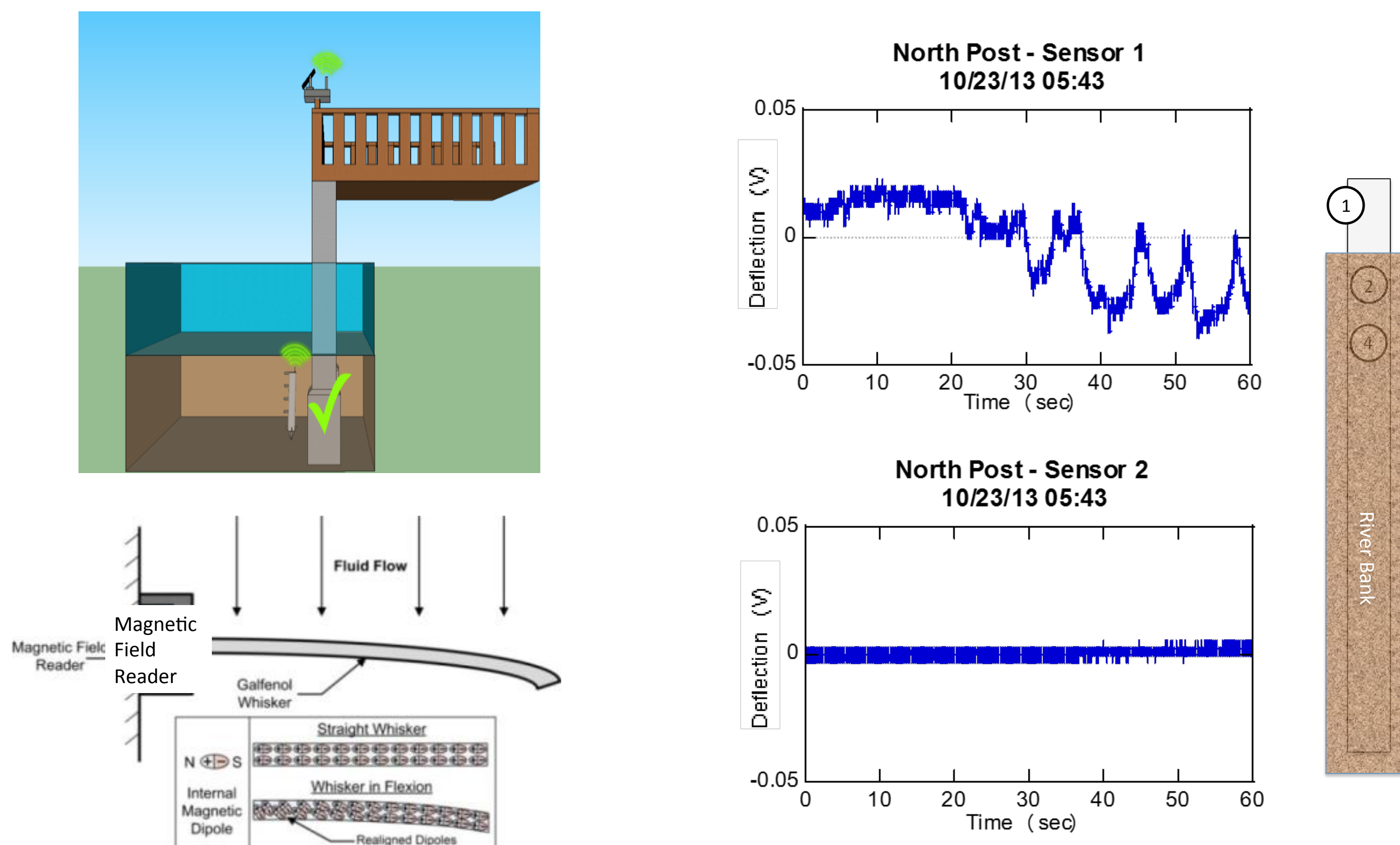
Both alloys are ductile and they have robust mechanical properties, relatively high permeability and good saturation magnetization (~ 1.7 Tesla for Fe-Ga). Abnormal grain growth process makes polycrystal into single crystal like materials.



Torque sensor



Flow sensor (Scour monitoring)

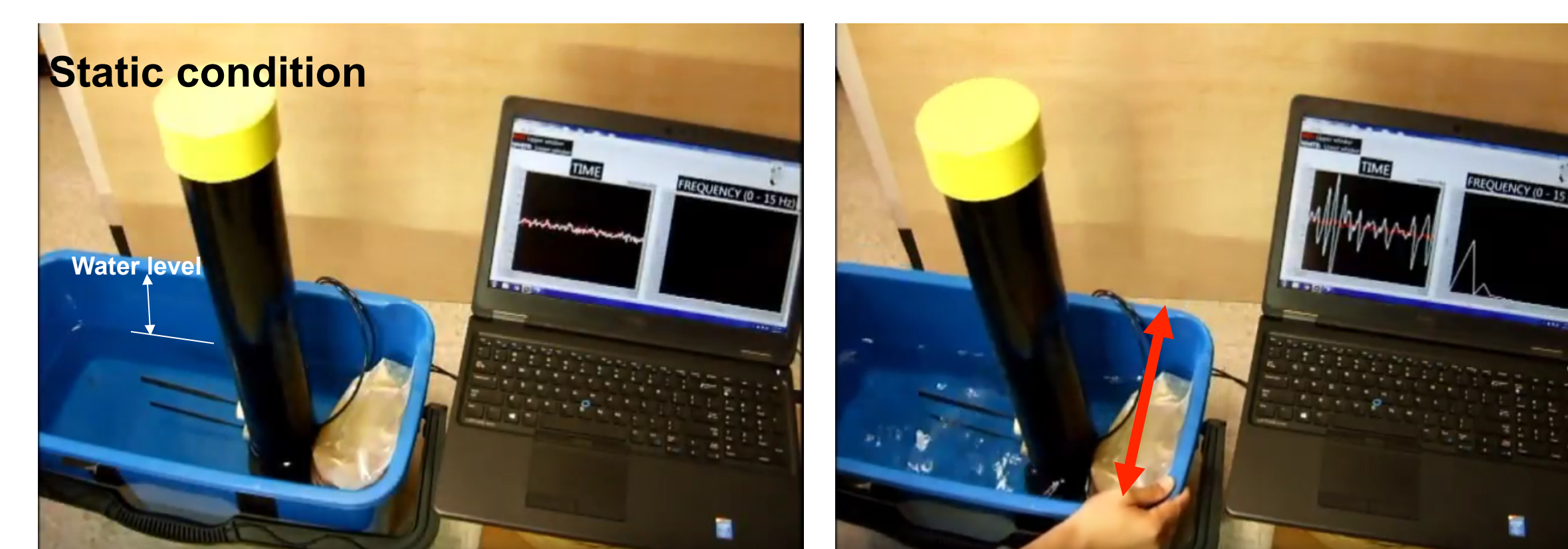


Bridge scour is the main cause for bridge failure. Fe-Ga whisker sensors were embedded under river bed to monitor scour happening.

USDOT/OST-R, MDOT, MDSHA

Bilge sediment sensor

Bottom whisker submerged in water top whisker in air



Bottom whisker buried in sand top whisker in water



The bilge is the lowest compartment on a ship below the waterline. Water that does not drain off the side of the deck drains down through the ship into the bilge. A sensor is needed to monitor sediment in the bilge.

