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Suppression of drift wave instability due to sheared field-aligned flow and negative ions RYUTA ICHIKI, KENICHIRO HAYASHI, TOSHIRO KANEKO, RIKIZO HATAKEYAMA, Tohoku University, Japan — Sheared field-aligned plasma flow is a significant topic in space/circumterrestrial plasmas. Taking into account negative ions or dust grains will make the space plasma physics more general and accurate. Using the Q_T-Upgrade Machine, we have conducted laboratory experiments to examine negative ion effects on shear-modified drift waves. Field-aligned K^+ ion flow and its shear strength are controlled with a concentrically segmented W hot plate. Negative ions SF_6^- are produced by introducing SF_6 gas in the plasma. The drift wave shows a gradual monotonic decrease in amplitude as the shear strength is increased from zero. However, as the shear strength is decreased from zero to negative values, the amplitude increases up to a certain shear strength and rapidly decreases after the peaking. The negative ion introduction, in general, suppresses this instability while retaining the dependence of the amplitude on the shear. These wave characteristics are interpreted using the theories of current-driven (kinetic) and of DAngelo (fluid) instabilities.

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