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Development of an atomic gravimeter based on atom interferometer TAEG YONG KWON, SANG-BUM LEE, SANG EON PARK, MYOUNG-SUN HEO, HYUN-GUE HONG, CHANG YONG PARK, WON-KYU LEE, DAI-HYUK YU, Korea Research Institute of Standards and Science — We present an atomic gravimeter under development at KRISS in Korea for precise measurement of absolute gravity. It is based on atomic interference of laser cooled ^{87}Rb atoms in free fall. The temperature of the atoms is cooled to about 5 μK in a magneto-optic trap. Three Raman light pulses are applied for splitting, reflecting and recombining the atoms clouds while the atoms are in free fall. The pulse width and spacing time of Raman pulses is 40 μs and about 50 ms, respectively. During the interferometry, the frequency difference between the two counter-propagating Raman beams is chirped to compensate for Doppler shift induced by gravitational acceleration. The interference signals are measured at different spacing times to find the chirping rate at which the phase of interference fringe is independent of the spacing time. The chirping rate ($\approx$ 25.1 MHz/s) corresponds to $g \cdot k_{eff}/2\pi$, where k_{eff} =k1+k2 (k1 and k2 are wave numbers for two Raman beams). At present, we are going to introduce an anti-vibration platform and a magnetic shield for accuracy evaluation of the gravimeter. In the presentation, the preliminary results of the KRISS gravimeter will be discussed.

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