In 2008, an improved superconducting gravimeter (No: SG-053) have been introduced from GWR company of USA by Institute of Seismology in China. After installed, tested and compared with absolute gravimeter, SG-053 has more than one year continuous operation in Wuhan gravity and tidal station. The instrument noise level is one of the most important factor for performance and evaluation in the station. Firstly, the gravity data of GS-053 and the harmonic pressure data had been analysed by the international generic tidal analysis software (VAV and ETERNA) for the white noise and tidal analysis result (tidal model, air pressure admittance). Secondly, the tidal gravity residual time series of the SG-053 has been analysed with maximum likelihood estimation (MLE), three (white noise, flicker noise, walk noise) noise models and their combination. Tidal analysis processed by two software show that there is only 0.004×10⁸/m² difference between two tidal model and the white noises are consistent each other. MLS analysis show that there is color noise in the tidal gravity residual. The color noise level is 1.40×10⁸/m². The flicker noise is 1.85×10⁸/m². The random walk noise is 2.40×10⁻⁸ ms⁻². This analysis result is consistent with the tidal analysis.