One pixel movie method to remove vibrations from SEM images

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EXTENDED ABSTRACT: When we obtain images from a scanning electron microscope (SEM), there are usually several types of noise. These noises have a serious impact on the quality of the images obtained. For example, the SEM has a mechanical pump and a molecular pump, which are used to provide a vacuum environment so that the emitted electron beam does not collide with impurities as it passes through the lens aperture and reaches the sample. However, the motors of these two pumps generate vibrations to the equipment. Generally, we try to suppress these vibrations as much as possible by means of a vibration suppressor outside the device. However, the distortion caused by the vibration can still be seen in the image. We propose a new processing algorithm, the one-pixel-movie method, to collect the vibration information by using a single point long time sampling, and use the vibration information to fit the SEM image to recover the measurement results without vibration. We use Monte Carlo method to calculate and simulate the SEM images of gold particles on carbon substrate under different vibration conditions [1], and recover the images by one-pixel-movie method, and the improved image results show its effectiveness.

Keywords： SEM images; vibration; noise reduction; image improvement; Monte Carlo

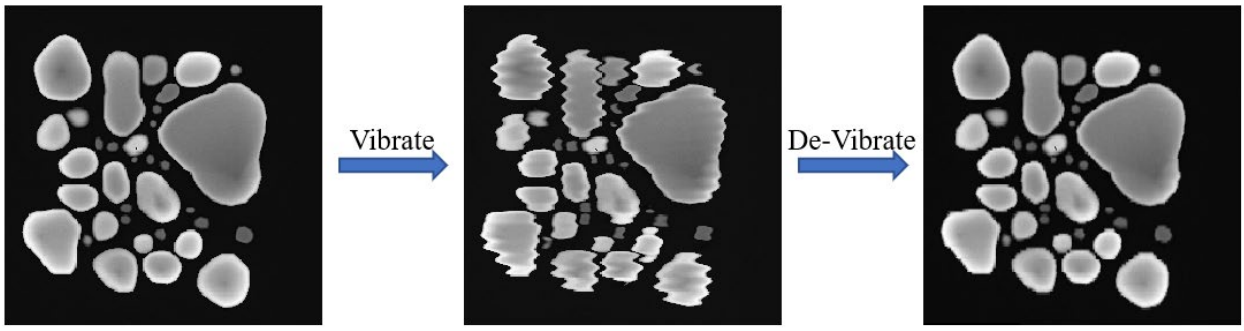

Figure 1. One-pixel-movie method de-vibration effect

REFERENCES

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BIOGRAPHY

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