METHODS OF RESOLVING ARTIFACTS IN HADAMARD-TRANSFORMED DATA

CROSS-REFERENCE TO RELATED APPLICATION

[001] This application claims priority to U.S. Patent Application No. 14/197,930, filed March 5, 2014, entitled "METHODS OF RESOLVING ARTIFACTS IN HADAMARD-TRANSFORMED DATA."

GOVERNMENT RIGHTS STATEMENT

[002] This invention was made with Government support under contract number DE-AC05-76RL01830 awarded by the U.S. Department of Energy and Grant ES022190 awarded by the National Institutes of Health. The Government has certain rights in the invention.

TECHNICAL FIELD

[003] The disclosed technology relates to methods and apparatus that can be used with Hadamard-transformed data, including mass spectrometry applications.

BACKGROUND

[004] Hadamard transform multiplexing has been used in mass spectrometry in order to increase the signal-to-noise ratio (SNR) of ion intensity data. When applied to ion mobility mass spectrometry (IMS), the transformed data are susceptible to periodic artifacts, such as those that occur when deconvolution is applied assuming that the data are precisely aligned to the mathematical sequence used to encode it.

[005] Previous techniques, for example, those discussed by Belov *et al.* in U.S. Patent No. ~~7,541,675~~7,541,576, involve the use of multiplexing with an ion mobility spectrometry (IMS) quadrupole time-of-flight (QTOF) mass spectrometry instrument, which utilizes an ion trap that allows for higher ion utilization and duty cycles greater than 50%.

SUMMARY

[006] Applying a Hadamard transform multiplexing scheme to an ion mobility mass spectrometer instrument system can improve the signal-to-noise ratio and duty cycle of the