

# On-line fault diagnosis model for rigid ceramic filters based on outlet concentration and dynamic pressure

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## Abstract

Sudden fractures in rigid ceramic filter tubes hinder the stable long-term operation of advanced power-generation processes. In this study, Time difference of arrival (TDOA) of dynamic pressure in the inner wall of filter during pulse jet cleaning process and outlet concentration with diameter of leakage during filtration and pulse jet cleaning process are investigated using high frequency sensors and optical particle spectrometry. The outlet concentrations measured under different leakage agreed with the theoretical values, with the peak outlet concentration being 2.5 times greater than stable outlet concentration. There is a linear relationship between leakage aperture and theoretical outlet concentration in leaking ceramic filter tubes. A positioning model that can precisely locate the leaking ceramic filter tube using the time difference in the dynamic pressure as measured at different positions is established. This research can quickly and accurately determine whether a ceramic filter tube is broken and location of breakage.

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