



Correction to: Non-invasive assessment of plasma parameters inside an ion thruster combining optical emission spectroscopy and principal component analysis

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The original article can be found online at <https://doi.org/10.1140/epjti/s40485-021-00070-x>

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In the publication of the article [1], the principle component analysis section contains mixed up indices. The corrected part of the affected section is shown below.

Corrected

First, the average spectrum of the entire reference data set $\overline{S_{PCA}}(\lambda)$ is subtracted from each spectrum $S(\lambda)$. To derive the new coordinates, i.e., the PCA-axes, the covariances σ_{ij} of each of the n wavelength positions with every other wavelength position (including itself) are calculated using

$$\sigma_{ij} = \frac{1}{m} \cdot \sum_{k=0}^m (x_{ki} - \overline{x_i}) \cdot (x_{kj} - \overline{x_j}) \quad \text{where } \overline{x_i} = \overline{x_j} = 0. \quad (1)$$

Here, x_{ki} and x_{kj} are the values of wavelength positions i and j of the spectrum k . Since the average intensities of each wavelength position $\overline{x_i}$ and $\overline{x_j}$ were already subtracted before, they are now zero.

With these covariances the covariance matrix \mathbf{C} is set up

$$\mathbf{C} = \begin{pmatrix} \sigma_{00} & \sigma_{01} & \cdots & \sigma_{0n} \\ \sigma_{10} & \sigma_{11} & \cdots & \sigma_{1n} \\ \vdots & \vdots & \ddots & \vdots \\ \sigma_{n0} & \sigma_{n1} & \cdots & \sigma_{nn} \end{pmatrix}. \quad (2)$$

All the changes that were requested are implemented in this correction and the original article [1] has been corrected.

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References

1. Nauschütt BT, Chen L, Holste K, Klar PJ. Non-invasive assessment of plasma parameters inside an ion thruster combining optical emission spectroscopy and principal component analysis. *EPJ Tech Instrum.* 2021;**8**(1). <https://doi.org/10.1140/epjti/s40485-021-00070-x>