***Errata*: Prepared by Shiladitya Sen**

Awtar, Slocum, and Sevincer, 2007, "Characteristics of Beam-Based Flexure Module" *ASME Journal of Mechanical Design*, 129 (6)

Section 5 of the above paper discusses the Double Parallelogram Flexure module and its variations. The in-plane rotations of the primary and secondary motion stages in this module are incorrectly expressed in Equation (27), in this paper.

The correct expressions for these rotations are provided in Equations (D) and (E), as derived below.

This rotation of both the stages in a double parallelogram is quite small and can be ignored with respect to the normalized Y direction displacements. Consequently,

$$y_1 = \frac{\boldsymbol{f}}{2a-\boldsymbol{p}e}, \qquad y-y_1 = \frac{\boldsymbol{f}}{2a-\boldsymbol{p}e}$$
$$y = \frac{4a\boldsymbol{f}}{(2a)^2-(e\boldsymbol{p})^2} \tag{A}$$

The definition of all the variables is as presented in the paper. Considering the primary stage, the results from a parallelogram flexure module can be used to write its rotation with respect to the secondary stage.

$$\theta-\theta_1 = \frac{1}{2w_2^2}\left\{\frac{1}{d}+(y-y_1)^2 r\right\}\left\{\boldsymbol{m}-(y-y_1)(2c+\boldsymbol{p}h)\right\} \tag{B}$$

The load on the secondary stage is similar as that on the primary stage, except that the axial load $\boldsymbol{p}$ is compressive and the moment is as follows:

$$\boldsymbol{m_1} = \boldsymbol{m}+\boldsymbol{f}-(y-y_1)\,\boldsymbol{p} \qquad \text{(clockwise)} \tag{C}$$

Therefore using the results of the parallelogram flexure module, the rotation of the secondary stage with the above loading can be written as below and further simplified using Eq.(A).

$$-\theta_1 = \frac{1}{2w_1^2}\left(\frac{1}{d}+ry_1^2\right)\left\{-\boldsymbol{m}-\boldsymbol{f}+\boldsymbol{p}(y-y_1)-y_1(2c-\boldsymbol{p}h)\right\}$$
$$\Rightarrow \theta_1 = \frac{1}{2w_1^2}\left(\frac{1}{d}+ry_1^2\right)\left\{\boldsymbol{m}+\boldsymbol{f}\left(1-\frac{\boldsymbol{p}}{(2a+\boldsymbol{p}e)}+\frac{2c-\boldsymbol{p}h}{2a-\boldsymbol{p}e}\right)\right\} \tag{D}$$

Using Eq.(D), Eq.(B) can be simplified to get an expression for the rotation of the primary stage of the double parallelogram.

$$
\begin{aligned}
\theta = & \frac{1}{2w_2^2}\left\{\frac{1}{d}+\frac{r\boldsymbol{f}^2}{\left(2a+\boldsymbol{p}e\right)^2}\right\}\left\{\boldsymbol{m}-\frac{\boldsymbol{f}}{\left(2a+\boldsymbol{p}e\right)}\left(2c+\boldsymbol{p}h\right)\right\} \\
& +\frac{1}{2w_1^2}\left(\frac{1}{d}+\frac{r\boldsymbol{f}^2}{\left(2a-\boldsymbol{p}e\right)^2}\right)\left\{\boldsymbol{m}+\boldsymbol{f}\left(1-\frac{\boldsymbol{p}}{\left(2a+\boldsymbol{p}e\right)}+\frac{2c-\boldsymbol{p}h}{2a-\boldsymbol{p}e}\right)\right\}
\end{aligned} \tag{E}
$$