$$\alpha_1^2 + \alpha_2^2 + \alpha_3^2 = 1,$$

and then averaging with Table 1 gives

$$\mathcal{E}_K = \frac{K_1}{5} + \frac{2}{5} K_1 e \cos^2\theta .$$

Since K_1 is usually two to three times smaller than the magnetoelastic constants, this contribution to the shock induced anisotropy effect can be ignored.

In obtaining the magnetoelastic energy correct to second order in the extension, both the first and second order magnetoelastic expressions in Equation (2.13) must be considered. This point has the same origin as the inconsistency first noticed by Brown. The second order correction to the first order magnetoelastic energy will be considered first. This energy expression is

$$\mathcal{E}_{me}^{(1)} = b_1(E_{11}\alpha_1^{*2} + E_{22}\alpha_2^{*2} + E_{33}\alpha_3^{*2}) +$$
$$2b_2(E_{12}\alpha_1^*\alpha_2^* + E_{23}\alpha_2^*\alpha_3^* + E_{31}\alpha_3^*\alpha_1^*).$$

With Equation (III.2) and Equation (III.4), this becomes

$$\mathcal{E}_{me}^{(1)} = b_1\Bigg[\left(e + \frac{e^2}{2}\right)(n_1^2\alpha_1^2 + n_2^2\alpha_2^2 + m_3^2\alpha_3^2) + 2e^2(n_1^4\alpha_1^2 + n_2^4\alpha_2^2 + n_3^4\alpha_3^2)$$
$$+ 2e^2(n_1n_2\alpha_1\alpha_2 + n_2n_3\alpha_2\alpha_3 + n_3n_1\alpha_3\alpha_1)$$
$$- 2e^2(n_1^2n_2n_3\alpha_2\alpha_3 + n_2^2n_3n_1\alpha_3\alpha_1 + n_3^2n_1n_2\alpha_1\alpha_2)\Bigg]$$
$$+ 2b_2\Bigg[\left(e + \frac{e^2}{2}\right)(n_1n_2\alpha_1\alpha_2 + n_2n_3\alpha_2\alpha_3 + n_3n_1\alpha_3\alpha_1)$$
$$+ e^2(n_1n_2\alpha_1\alpha_2 + n_2n_3\alpha_2\alpha_3 + n_3n_1\alpha_3\alpha_1)$$

$$+ e^2(n_1^2n_2n_3\alpha_2\alpha_3 + n_2^2n_3n_1\alpha_3\alpha_1 + n_3^2n_1n_2\alpha_1\alpha_2)$$

$$+ e^2(n_1^2\alpha_1^2 + n_2^2\alpha_2^2 + n_3^2\alpha_3^2) - e^2(n_1^4\alpha_1^2 + n_2^4\alpha_2^2 + n_3^4\alpha_3^2)\Big]$$

$$+ \theta(e^3) + \ldots$$

Averaging this expression with the aid of Table 1 gives

$$\mathcal{E}_{me}^{(1)} = \left[\left(\frac{2}{5}b_1 + \frac{3}{5}b_2\right)e + \left(\frac{14}{10}b_1 + \frac{11}{10}b_2\right)e^2\right]\cos^2\theta$$

for the first order magnetoelastic energy correct to second order in e. Note that in the case of isotropy

$$\mathcal{E}_{me}^{(1)} = b\left(e + \frac{5}{2}e^2\right)\cos^2\theta.$$

The second order magnetoelastic energy is

$$\mathcal{E}_{me}^{(2)} = \frac{1}{2}B_{111}(E_{11}^2\alpha_1^{*2} + E_{22}^2\alpha_2^{*2} + E_{33}^2\alpha_3^{*2})$$

$$+ B_{123}(E_{11}E_{22}\alpha_3^{*2} + E_{22}E_{33}\alpha_1^{*2} + E_{33}E_{11}\alpha_2^{*2})$$

$$+ 2B_{144}(E_{11}E_{23}\alpha_2^*\alpha_3^* + E_{22}E_{31}\alpha_3^*\alpha_1^* + E_{33}E_{12}\alpha_1^*\alpha_2^*)$$

$$+ 2B_{441}(E_{23}^2\alpha_1^{*2} + E_{31}^2\alpha_2^{*2} + E_{12}^2\alpha_3^{*2})$$

$$+ 2B_{155}((E_{11} + E_{22})E_{12}\alpha_1^*\alpha_2^* + (E_{22} + E_{33})E_{23}\alpha_2^*\alpha_3^* +$$

$$(E_{33} + E_{11})E_{31}\alpha_3^*\alpha_1^*) + 4B_{456}(E_{23}E_{31}\alpha_1^*\alpha_2^* + E_{31}E_{12}\alpha_3^*\alpha_2^*$$

$$+ E_{12}E_{23}\alpha_1^*\alpha_3^*).$$

In this expression, it is correct to second order in e to replace E_{ij} by e_{ij} and α_j^* by α_j. This gives