Commun. math. Phys. 60, 192 (1978)

Communications in Mathematical Physics

Erratum

Kummer, M.: On Resonant Non Linearly Coupled Oscillators with Two Equal Frequencies. Commun. math. Phys. **48**, 53—79 (1976)

The expression (3.5) (p. 63) is in general only correct if $n=2$. Accordingly, the remark at the bottom of p. 77 is invalid.

In order to give the correct expression for general n we write the expansion (3.14) in the form

$$F(\xi,\eta)=-\tfrac{1}{2}(A\xi^2+B\eta^2)+\sum_{k=0}^{3}B_{k3-k}\xi^k\eta^{3-k}+\sum_{k=0}^{4}C_{k4-k}\xi^k\eta^{4-k}+\mathcal{O}_5\,, \tag{3.14}$$

where $\mathcal{O}_5$ is a convergent power series in ξ, η beginning with a term of order five. If we use the notation

$$A_{113}=\frac{\partial^3 K^{(n)}}{\partial x^2\partial z}(-e_3)\quad\text{etc.}\,,$$

the coefficients in the expansion (3.14) are given by the following expressions

$$\left.\begin{aligned}
&B_{30}=\tfrac{1}{2}A_{13}+\tfrac{1}{6}A_{111} \qquad B_{03}=\tfrac{1}{2}A_{23}+\tfrac{1}{6}A_{222}\\
&B_{12}=\tfrac{1}{2}(A_{13}+A_{122}) \qquad B_{21}=\tfrac{1}{2}(A_{23}+A_{112})\\
&C_{40}=\tfrac{1}{8}(A-C)+\tfrac{1}{4}A_{113}+\tfrac{1}{24}A_{1111}\\
&C_{04}=\tfrac{1}{8}(B-C)+\tfrac{1}{4}A_{223}+\tfrac{1}{24}A_{2222}\\
&C_{22}=\tfrac{1}{8}(A+B-2C)+\tfrac{1}{4}(A_{113}+A_{223}+A_{1122})
\end{aligned}\right\} \tag{*}$$

The expressions for the coefficients C_{13} and C_{31} have been omitted because they are not needed in the following.

The correct expression which for general n replaces (3.5) is

$$\tfrac{3}{2}A[4A^2B_{03}^2+(B_{03}A+B_{21}B)^2]+\tfrac{3}{2}B[4B^2B_{30}^2+(B_{30}B+B_{12}A)^2]+AB(3C_{40}B^2+C_{22}AB+3C_{04}A^2)\,. \tag{3.5'}$$

Only if all A's with three or four subscripts in the list (*) vanish, as is certainly the case for $n=2$, the expression (3.5') (after multiplication by a factor 8) simplifies to the expression (3.5)

Remark. The function $F(\xi,\eta)$ as defined in (2.28) differs from the function entering (3.10) [and (3.14)] by the additive constant $K^{(n)}(-e_3)$.