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Erratum

Corrigenda to "A simplified implementation of the discrete-ordinates method for a class of problems in radiative transfer with polarization" [J Quant Spectrosc Radiat Transfer 2011;112:2801–13]

R.D.M. Garcia^{a,*}, C.E. Siewert^b

^a Instituto de Estudos Avançados, Trevo Cel. Av. José Alberto Albano do Amarante no 1, São José dos Campos, SP 12228-001, Brazil ^b Mathematics Department, North Carolina State University, Raleigh, NC 27695-8205, USA

A few corrections are needed in the aforementioned work. First of all, Section 3 should have started with "In the manner of Ref. [6], …". Secondly, the definition of $\Phi_{-}(v_j)$, one of the vectors of elementary solutions given by Eq. (22), was written in an incorrect way. And so, Eq. (22) of [1] is to be replaced with the following equations (see [2]):

$$\mathbf{\Phi}_{+}(v_{j}) = \begin{pmatrix} \mathbf{\Phi}(v_{j}, \mu_{1}) \\ \mathbf{\Phi}(v_{j}, \mu_{2}) \\ \vdots \\ \mathbf{\Phi}(v_{j}, \mu_{N}) \end{pmatrix}$$
(22a)

and

$$\boldsymbol{\Phi}_{-}(v_{j}) = \begin{pmatrix} \mathbf{D}\boldsymbol{\Phi}(v_{j}, -\mu_{1}) \\ \mathbf{D}\boldsymbol{\Phi}(v_{j}, -\mu_{2}) \\ \vdots \\ \mathbf{D}\boldsymbol{\Phi}(v_{j}, -\mu_{N}) \end{pmatrix},$$
(22b)

where $\mathbf{D} = \text{diag}\{1, 1, -1, -1\}$. A couple of additional equations were affected by the incorrect definition of $\Phi_{-}(v_j)$ in [1]: Eq. (34) is to be replaced with

$$\mathbf{S}_{+}(v_{j}) = \sum_{n=1}^{N} w_{n} \mu_{n} \mathbf{\Phi}(v_{j}, \mu_{n})$$
(34a)

and

$$\mathbf{S}_{-}(v_{j}) = \sum_{n=1}^{N} w_{n} \mu_{n} \mathbf{D} \boldsymbol{\Phi}(v_{j}, -\mu_{n}),$$
(34b)

and Eq. (37) is to be replaced with

$$\mathbf{G}_{+}(v_{j}) = \sum_{n=1}^{N} w_{n} \mathbf{P}_{l}^{m}(\mu_{n}) \mathbf{\Phi}(v_{j},\mu_{n})$$
(37a)

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* Corresponding author.

E-mail address: rdgarcia@ieav.cta.br (R.D.M. Garcia).

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and

$$\mathbf{G}_{-}(v_{j}) = \sum_{n=1}^{N} w_{n} \mathbf{P}_{l}^{m}(\mu_{n}) \mathbf{D} \mathbf{\Phi}(v_{j}, -\mu_{n}).$$
(37b)

Finally, Eq. (32b) of [1] has incorrect spatial arguments in the *C* and *S* functions and should be corrected as follows:

$$\mathbf{I}(\tau,-\mu) = \mathbf{I}(\tau_{0},-\mu)e^{-(\tau_{0}-\tau)/\mu} + \frac{\varpi}{2}\mathbf{D}\sum_{j=1}^{4N}v_{j}[A_{j}\mathbf{T}_{-}(v_{j},\mu)e^{-\tau/v_{j}}S(\tau_{0}-\tau:v_{j},\mu) + B_{j}\mathbf{T}_{+}(v_{j},\mu)C(\tau_{0}-\tau:v_{j},\mu)].$$
(32b)

A final remark: The computer program used to generate the numerical results tabulated in [1] was based on the correct equations that are presented in this corrigenda. Therefore, the numerical results reported in Tables 2–18 of [1] remain valid.

References

^[1] Garcia RDM, Siewert CE. A simplified implementation of the discrete-ordinates method for a class of problems in radiative transfer with polarization. J Quant Spectrosc Radiat Transfer 2011;112:2801–13.

^[2] Siewert CE. A discrete-ordinates solution for radiative-transfer models that include polarization effects. J Quant Spectrosc Radiat Transfer 2000;64: 227–54.