Additional comments to the VEF part of Project 2

- The source function is given by

$$S = (1 - \epsilon)J + \epsilon B\,. \tag{1}$$

For this part of the project, ϵ and B are input parameters, taken as depth-independent. Since B given only a numerical scale of the problem, one can set here

$$B = 1\,. \tag{2}$$

The thermal coupling parameter ϵ is a free parameter. A typical value is $\epsilon = 10^{-4}$, and a few more value may be considered as well, say between 10^{-1} and 10^{-6}.

- We solve the problem of coherent scattering and parametrize B, so the frequency does not enter here. In other words, there is only one frequency, and its numerical value is inconsequential (in reality, it would determine the values of B and ϵ).

- The problem is solved when J or S are determined. Since J is the mean intensity, its evaluation involves an integration over discretized angle points. In terms of Feautrier intensities, J is given by

$$J = \int_0^1 j_\mu d\mu \quad \rightarrow \quad \sum_{=1}^{NA} w_i j_i\,, \tag{3}$$

where $j_i \equiv j(\mu_i)$ is the Feautrier intensity in the discretized angle point μ_i, and w_i is the corresponding quadrature weight; NA is the number of discretized angles. One can choose any quadrature scheme (trapezoidal, Simpson, etc.), but in the radiation transport codes one usually uses the Gaussion quadrature, which even with $NA = 3$ is sufficiently accurate. In this case, the corresponding angle points (AMU) and weights (WTMU) are, in the FORTRAN syntax

```
      DATA AMU/.887298334620742D0,.5D0,.112701665379258D0/,
     *     WTMU/.277777777777778D0,.444444444444444D0,
     *          .277777777777778D0/
```