First of all to understand what amount of radioactivity was released the mass inventory of Cs-137 [kg] should be converted to Bq. To do so we use definition of Bq:

$$R[Bq] = -\frac{dN}{dt} = \lambda N = \lambda \frac{M}{\mu} N_A \tag{1}$$

Where N is the amount of atoms radioactive matter, λ is decay constant (7.3 E-10 1/s for Cs-137). Molecular weight of Cs-137 is 137 g/mol=0.137 kg/mol. Thus M=2 kg of Cs-137 contains N= N_A*M/0.137=6E23*2/0.137=8.7E24 atoms of Cs-137 (N_A being Avogadro number). Thus total inventory of released Cs-137 in our scenario, R=7.3 E-10 * 8.7E24=6.3E15 Bq.

To convert deposition from [ng·m-2] to [Bq·m-2] use formula:

$$D[Bq \cdot m^{-2}] = 10^{-12} \cdot \lambda \frac{N_A}{\mu[kg \cdot mol^{-1}]} D[ng \cdot m^{-2}] = 10^{-9} \cdot \lambda \frac{N_A}{\mu[g \cdot mol^{-1}]} D[ng \cdot m^{-2}] \tag{2}$$

As it was shown above, units that are declared in output file are ppt (parts per trillion). Let C be volumetric concentration of radioactivity in [Bq·m-3], while n_t is volume number density of gas [m-3] (number of atoms in cubic meter) while n is volume number density of radionuclide. Then, as it is obvious from previous considerations:

$$ppt = \frac{10^{12} n}{n_t} = \frac{C / \lambda}{(1000/24) N_A}$$

Here formula (1) was used and n_t was defined through Avogadro number. Hence:

$$C = 10^{-12} (1000/24) N_A \lambda \cdot ppt \tag{3}$$

In case of Cs-137: C[Bq·m-3]=1.83E4·ppt.

With so defined formulas for units conversions the results of RODOS and FLEXPART are very consistent. For the same source term (about 6.3E15 Bq of Cs-137 released during 12 hours at 500 m height) and the same meteorological scenario we obtained the following estimates of maximum time-average concentration and maximum deposition:

	FLEXPART	RODOS (DIPCOT)
Max. dry deposition [Bq·m-2]	1.6E5	3.8E5
Max. average concentration [Bq·m-3]	2.6E3	2.4E3
Dist. from the source to max. average concentration [km]	9	7