$F = \{ Z = a.Z + b.Y,\ Y = b.Y \}$

We define an auxiliary guarded recursive specification $E' = \{ Z_n = a.Z_{n+1} + b.Y \mid n \in \mathbb{N} \}$

and define a sequence of terms denoting a solution for E':

Define $t_0, t_1, \dots, t_i, \dots$ $(i \in \mathbb{N})$ with induction on i by $t_0 \equiv X$ and $t_{i+1} \equiv t_i \blacktriangleright b.Y$

We prove that $t_i = a.t_{i+1} + b.Y$ for all $i \in \mathbb{N}$ with induction on i:

If $i = 0$, then $t_i \equiv t_0 = X = a.X \blacktriangleright b.Y \overset{D_3}{=} a.(X \blacktriangleright b.Y) + b.Y = a.t_1 + b.Y$

Let $i \in \mathbb{N}$ and suppose that $t_i = a.t_{i+1} + b.Y$ (IH). Then

$$\begin{aligned} t_{i+1} \equiv t_i \blacktriangleright b.Y &\overset{IH}{=} (a.t_{i+1} + b.Y) \blacktriangleright b.Y \overset{D_3}{=} (a.t_{i+1} \blacktriangleright b.Y) + (b.Y \blacktriangleright b.Y) \\ &\overset{D_2}{=} a.(t_{i+1} \blacktriangleright b.Y) + b.Y + (b.Y \blacktriangleright b.Y) \\ &= a.t_{i+2} + b.Y \end{aligned}$$

So $t_0, t_1, t_2, \dots$ denotes a solution of E'

Define a sequence of terms denoting a solution of F:

Define $u_0, u_1, \dots, u_i, \dots$ $(i \in \mathbb{N})$ with induction on i by $u_0 \equiv Z$ and $u_{i+1} \equiv u_i$

We prove that $u_i = a.u_{i+1} + b.Y$ for all $i \in \mathbb{N}$ with induction on i:

If $i = 0$, then $u_i \equiv u_0 = Z = a.Z + b.Y = a.u_1 + b.Y$

Let $i \in \mathbb{N}$ and suppose that $u_i = a.u_{i+1} + b.Y$ (IH). Then

$$u_{i+1} \equiv u_i + b.Y \overset{IH}{=} (a.u_{i+1} + b.Y) + b.Y = a.u_{i+1} + b.Y = a.u_{i+2} + b.Y$$

So $u_0, u_1, u_2, \dots$ denotes a solution of E'.

Hence both $t_0, t_1, \dots$ and $u_0, u_1, \dots$ denote solution of E', and therefore, in every model satisfying RSP we have that $\mu X.E = X \equiv t_0 = u_0 \equiv Z = \mu Z.F$