

**Affine Lie algebras and applications**  
**Ten-minutes problem 8**

1. Prove that  $[e_i, (ad^{1-A_i, j} f_i) f_j] = 0$ .
2. Let  $n_i = \exp(ad e_i) \exp(-ad f_i) \exp(ad e_i)$ . Prove that  $n_i(x) = x - \alpha_i(x) h_i$  for any  $x \in \mathfrak{h}$ .