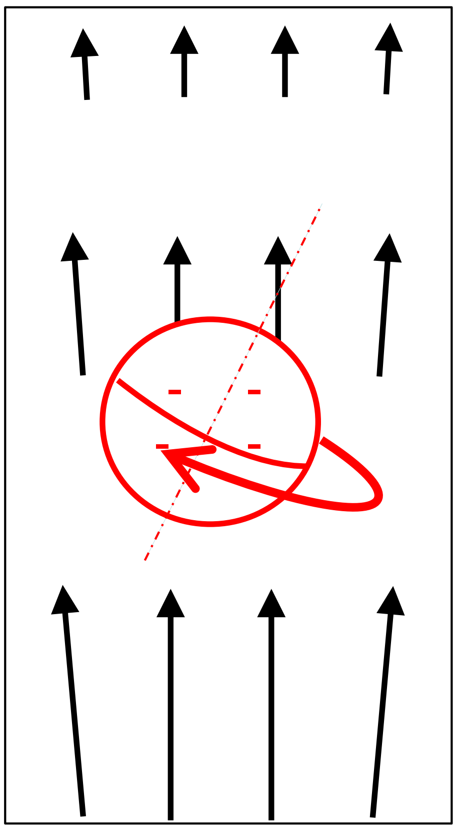
A solid spinning sphere of negative charge sits in the B-field shown.

In which directions are $\vec{S}$ and $\vec{\mu}$ of this sphere?



A)  and 

B)  and 

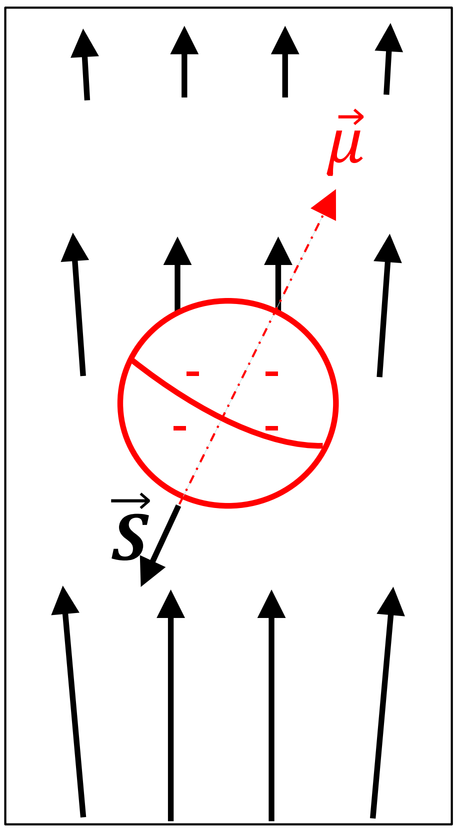
C)  and 

D)  and 

E) Other

In which direction is the approximate force on the sphere?

$$F_z \approx \mu_z \frac{\partial B_z}{\partial z}$$



A) Up

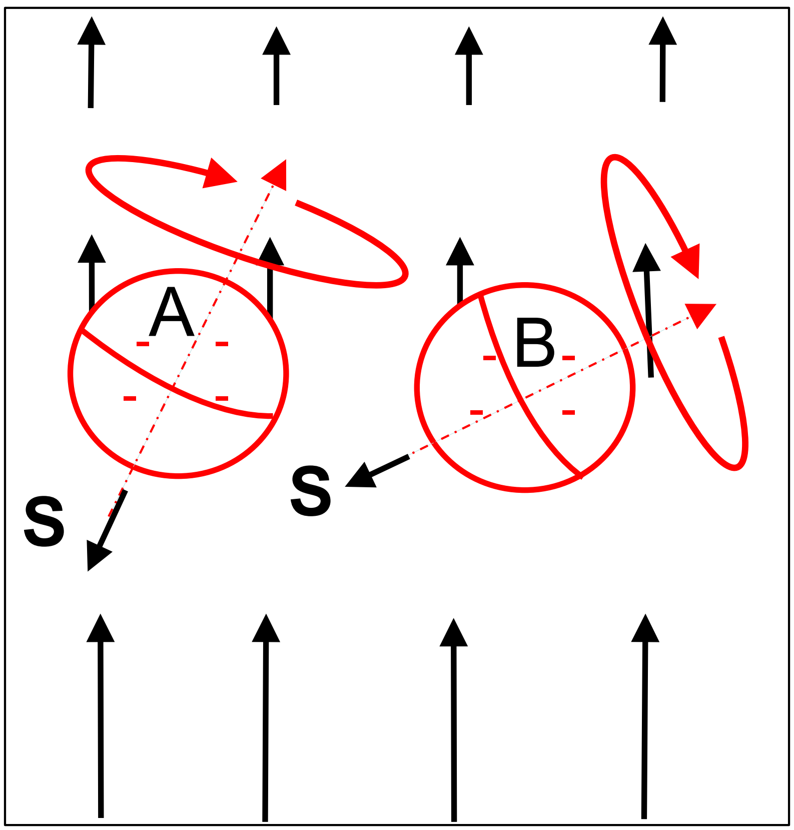
B) Down

C) Zero

The two spheres are spinning with the same angular momentum, just oriented differently.

Which sphere feels the larger |force?|

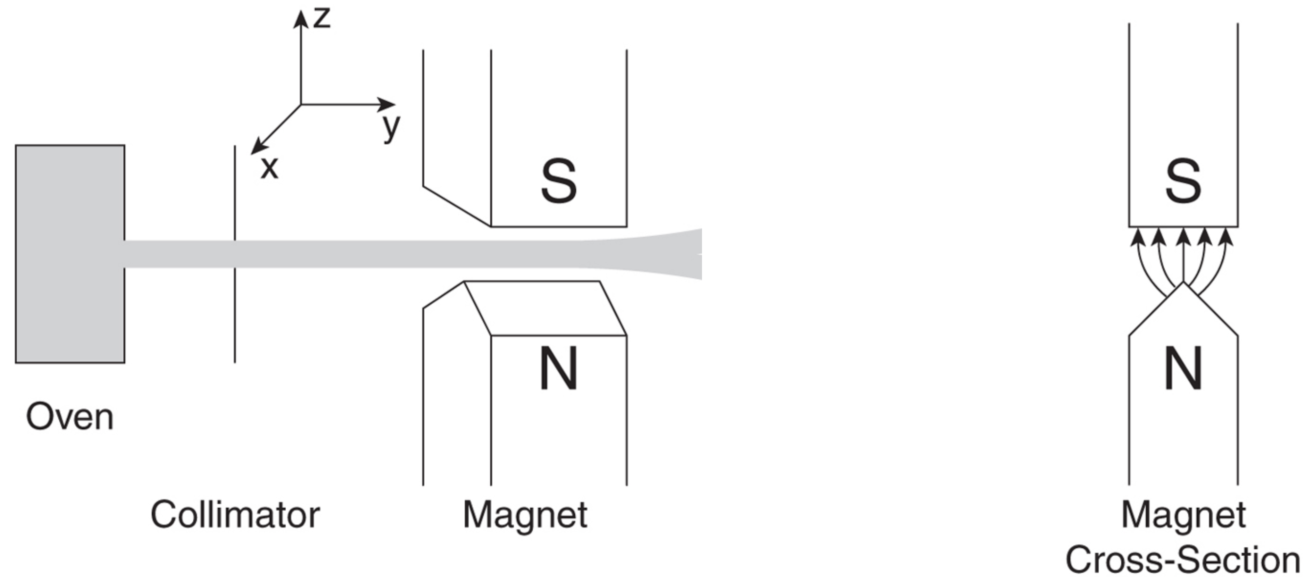
$$F_z \approx \mu_z \frac{\partial B_z}{\partial z}$$



A) A

B) B

C) It's the same.


z
y
x
S
N
Oven
Collimator
Magnet
S
N
Magnet
Cross-Section

Given the classical formula $F_z \approx g \frac{-e}{2m_e} S_z \frac{\partial B_z}{\partial z}$

What pattern would you expect to see for a thin beam of neutral silver atoms passing through a Stern-Gerlach device?

A)1 beam spot (if the atoms are neutral)
B) A continuous smear at various angles
C) Discrete, separated spots
D) None of these!

Stern-Gerlach Experiment