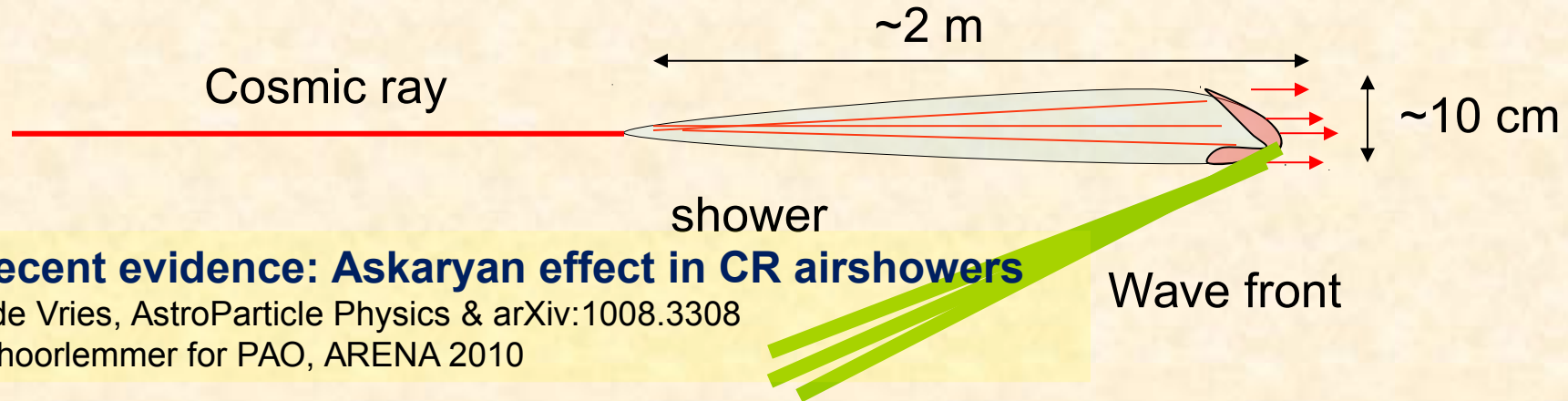


Askaryan effect -2: Coherent Čerenkov emission



Important magnitudes:

- Leading cloud of electrons, $v \approx c$
Typical size of order 10cm
Coherent Čerenkov for $\nu \leq 2\text{-}5$ GHz
 $\cos \theta_c = 1/n$, $\theta_c = 56^\circ$ for ∞ shower length
- Length of shower, $L \approx 2\text{-}3$ m
strong angular spreading for $\nu \approx 100$ MHz

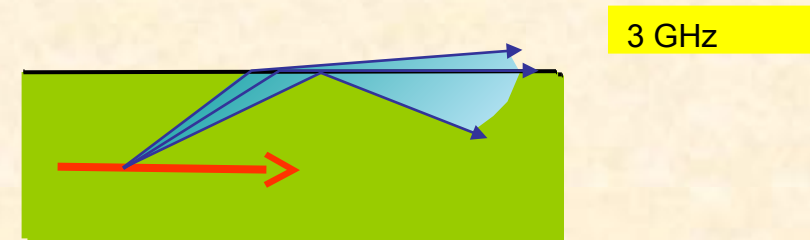
Cosmic rays, Position on Moon



O.S. et al, Astropart.Phys. 26 (2006) 219

Calculations for

$$E_{\text{cr}} = 4 \cdot 10^{21} \text{ eV}$$



With decreasing ν
rim **inside**
increasing probability:

$\int$ over surface Moon

Detection probability $\propto \nu^{-3}$

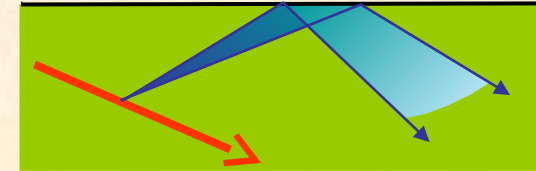
Cosmic rays, Position on Moon



O.S. et al, Astropart.Phys. 26 (2006) 219

Calculations for

$$E_{\text{cr}} = 4 \cdot 10^{21} \text{ eV}$$



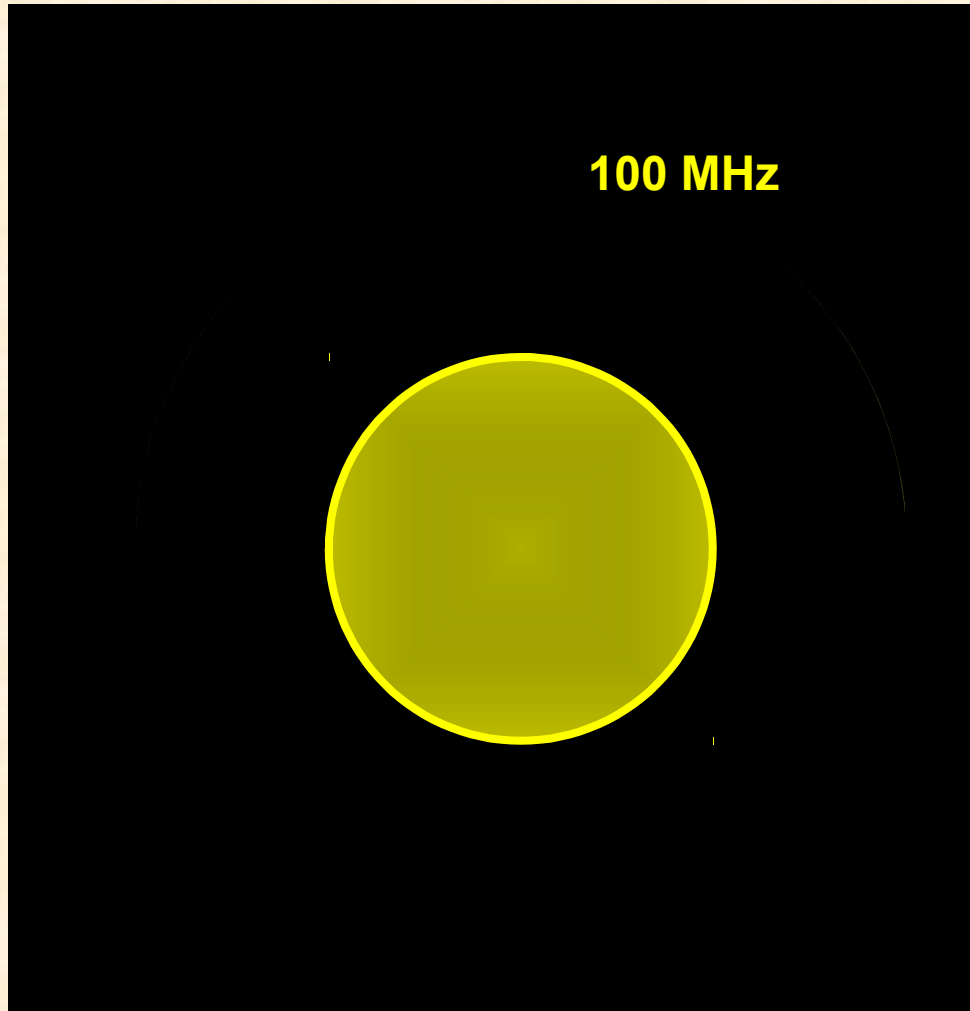
3 GHz

With decreasing ν
rim **inside**
increasing probability:

$\int$ over surface Moon

Detection probability $\propto \nu^{-3}$

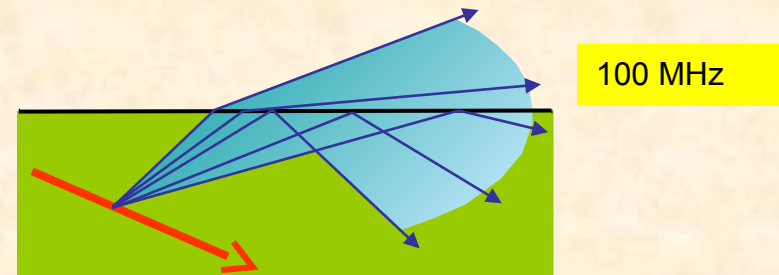
Cosmic rays, Position on Moon



O.S. et al, Astropart.Phys. 26 (2006) 219

Calculations for

$$E_{\text{cr}} = 4 \cdot 10^{21} \text{ eV}$$

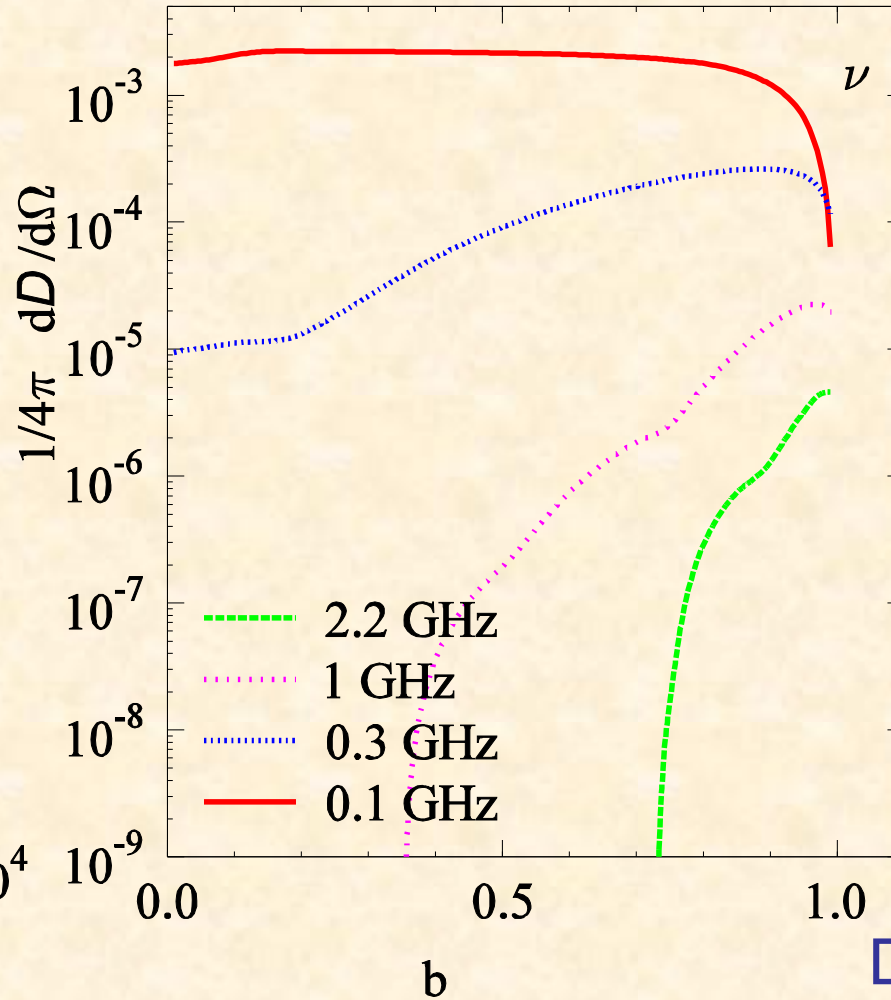
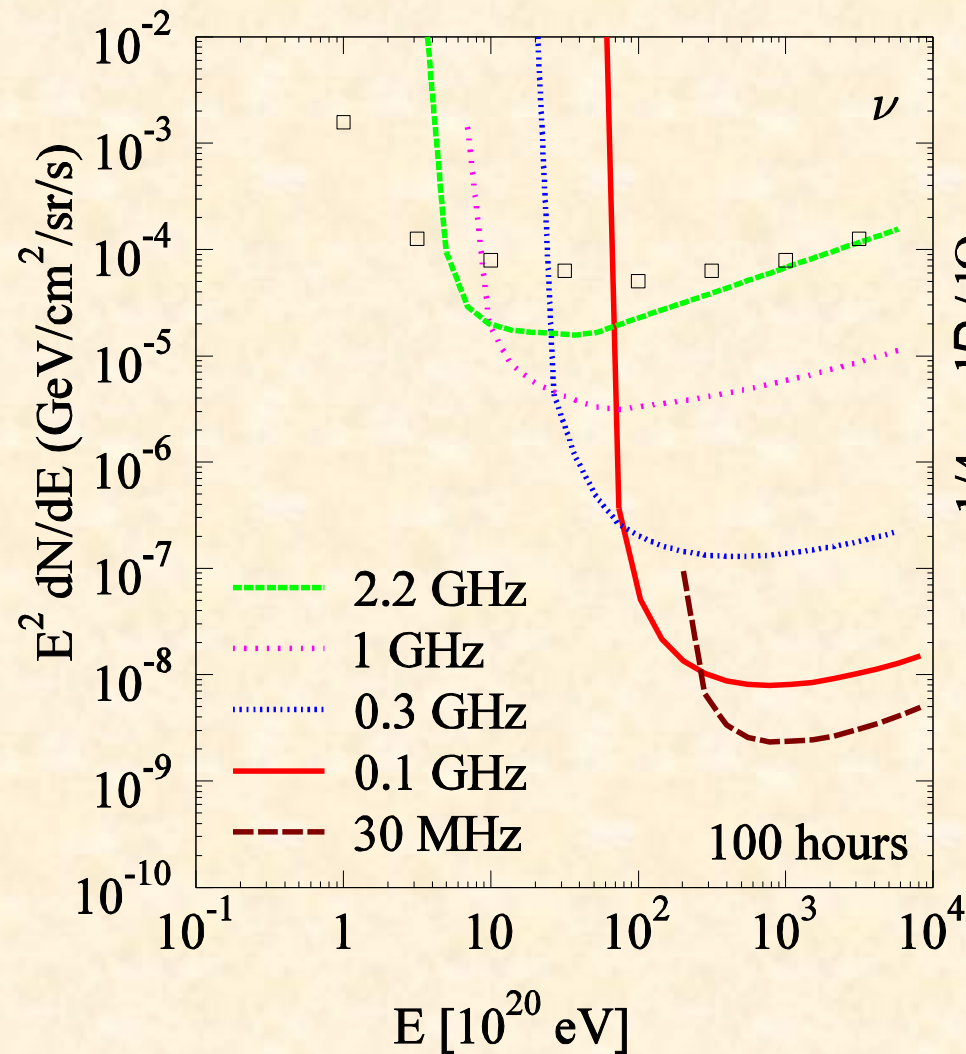


With decreasing ν
rim **inside**
increasing probability:

$\int$ over surface Moon

Detection probability $\propto \nu^{-3}$

Results of calculations for neutrinos:



RFI-emission, mainly from the center:

<http://arxiv.org/pdf/1407.4244v1.pdf>

Decreasing ν , Increase:

- Threshold like ν^{-1}
- Sensitivity like ν^{-3}

Luna,
Wed Jun 29 2005
13:35:12