Queen Mary University of London
UNIVERSITY OF Southampton
IFIC

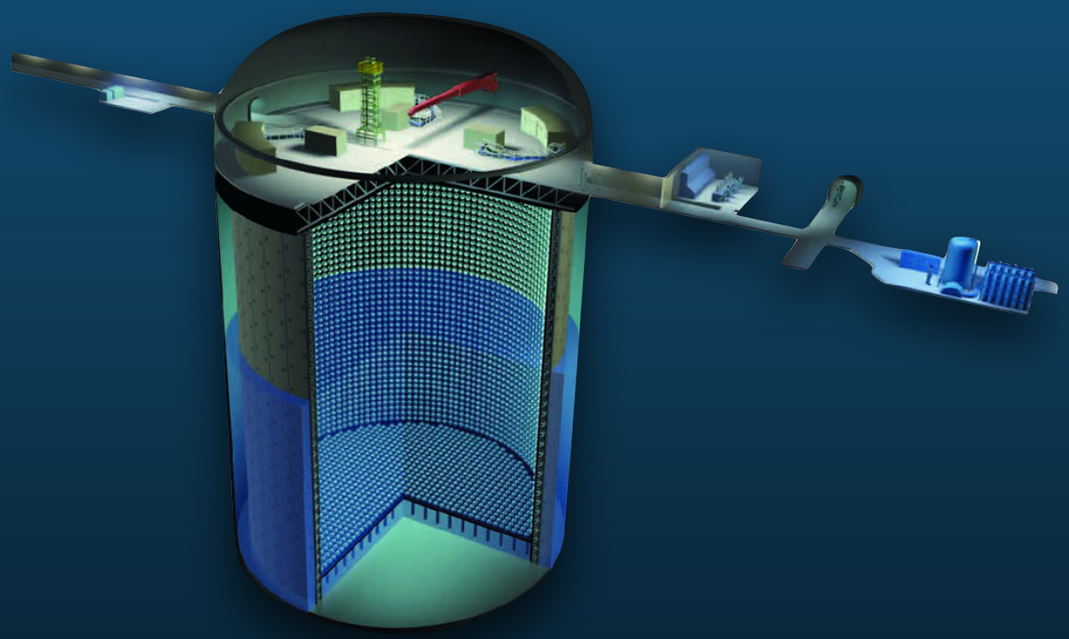
Seasonal Variation of Solar Neutrino Flux at Super-Kamiokande

Susana Molina Sedgwick

NuPhys 2019

Super Kamiokande

Super Kamiokande



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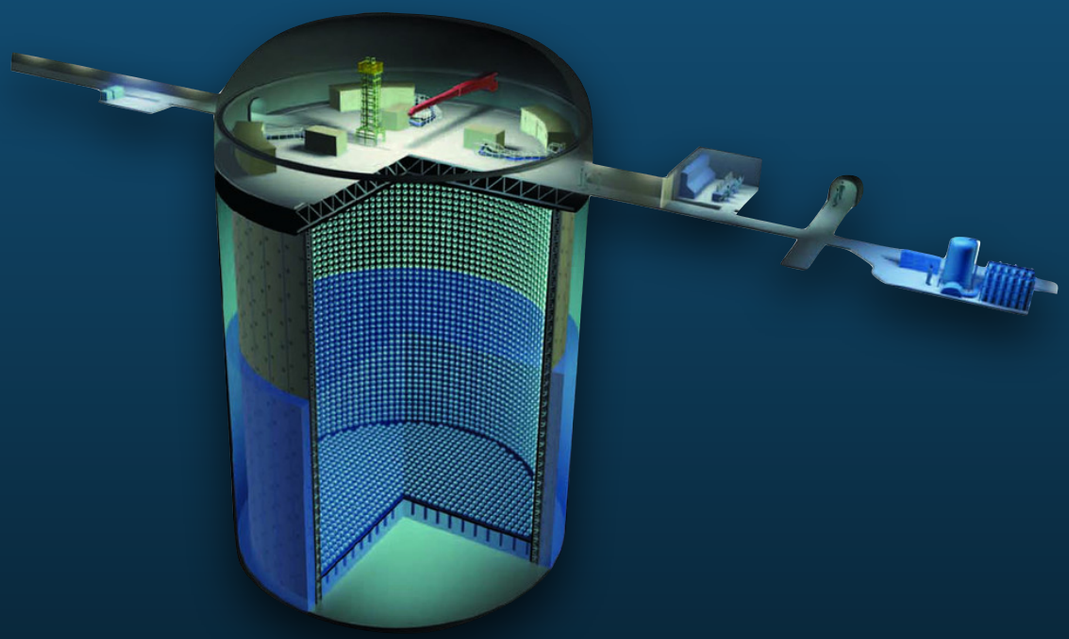

- Tank made of stainless steel
- ~ 50,000 tons of ultra pure water
- ~ 13,000 Photo-Multiplier Tubes (PMTs)

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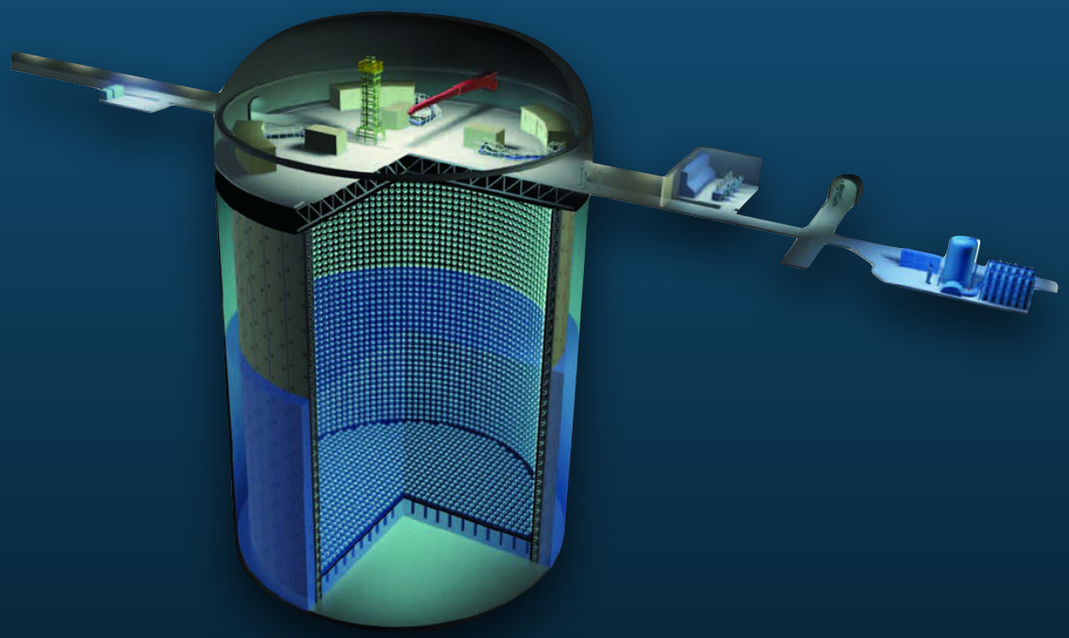

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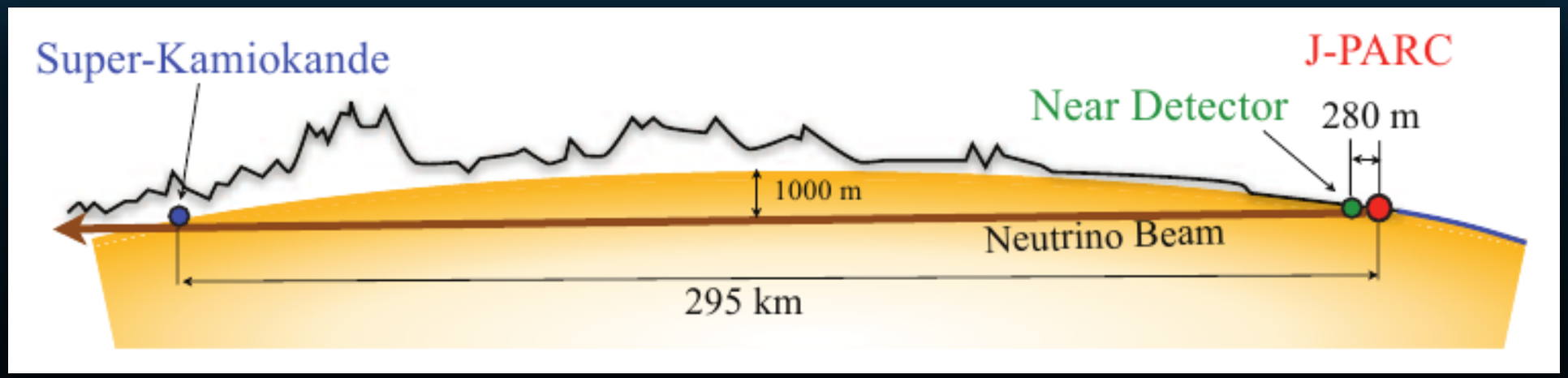
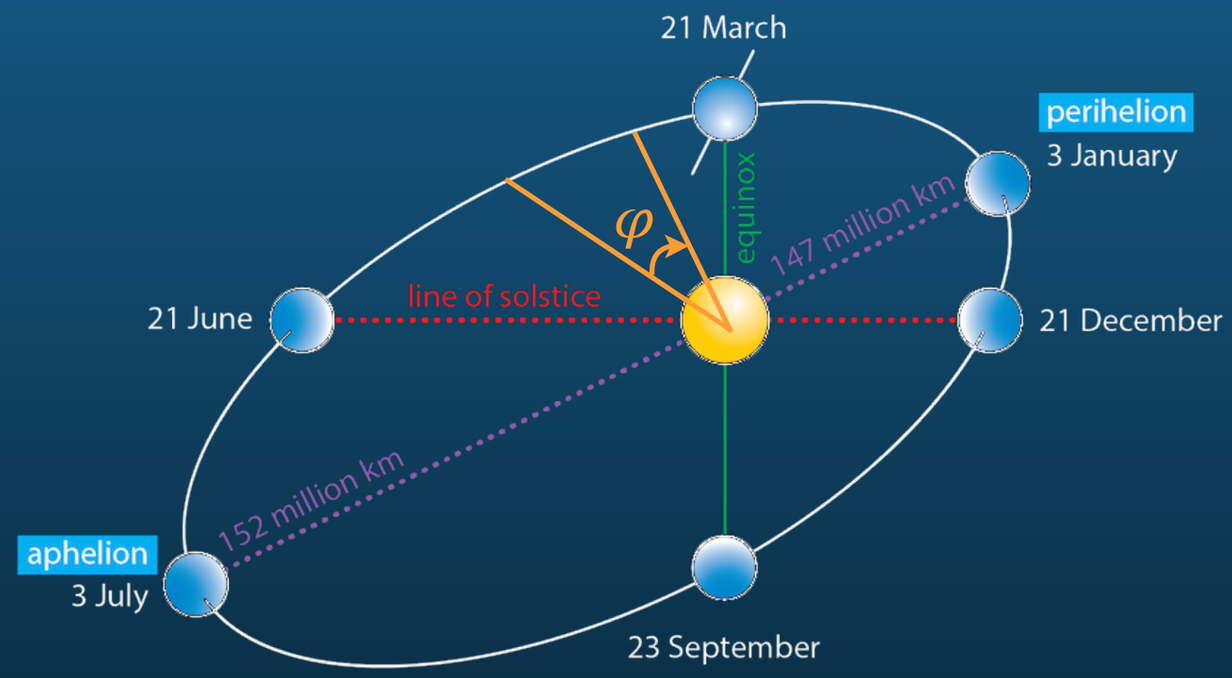


Seasonal Variation

Seasonal Variation

Expected variation in the solar neutrino flux depends on:

- Spherical symmetry: $1/r^2$
- MSW effect



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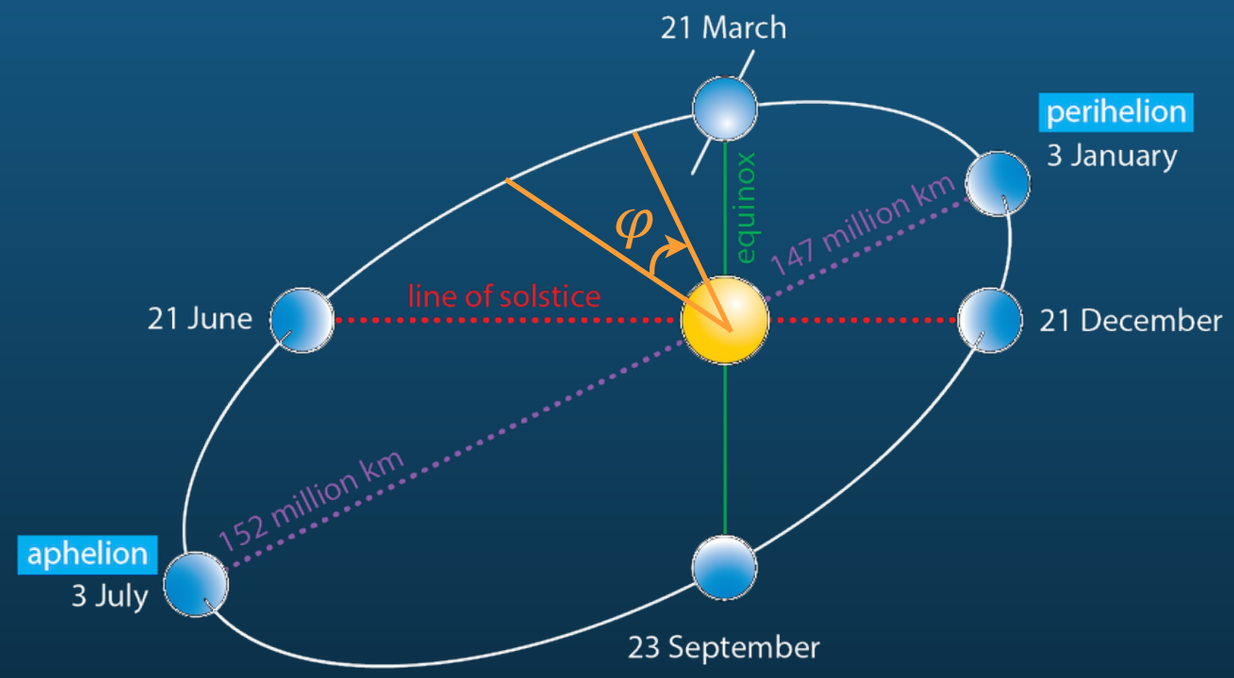

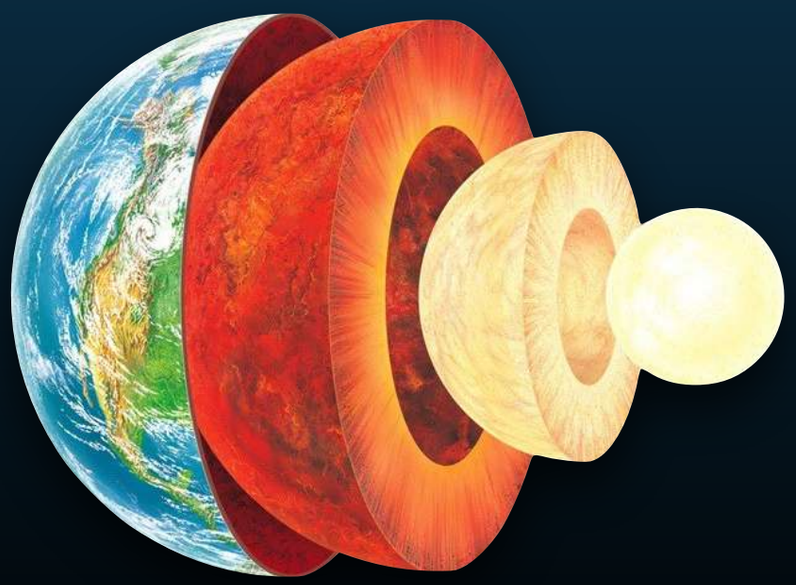

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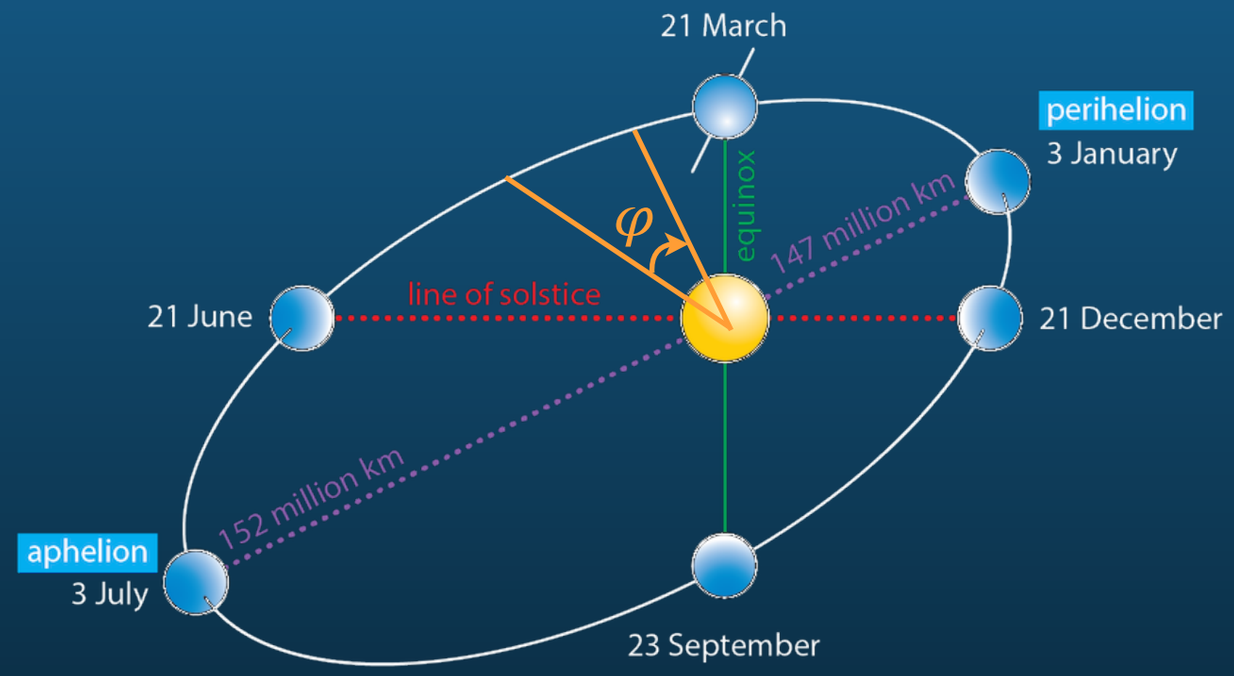
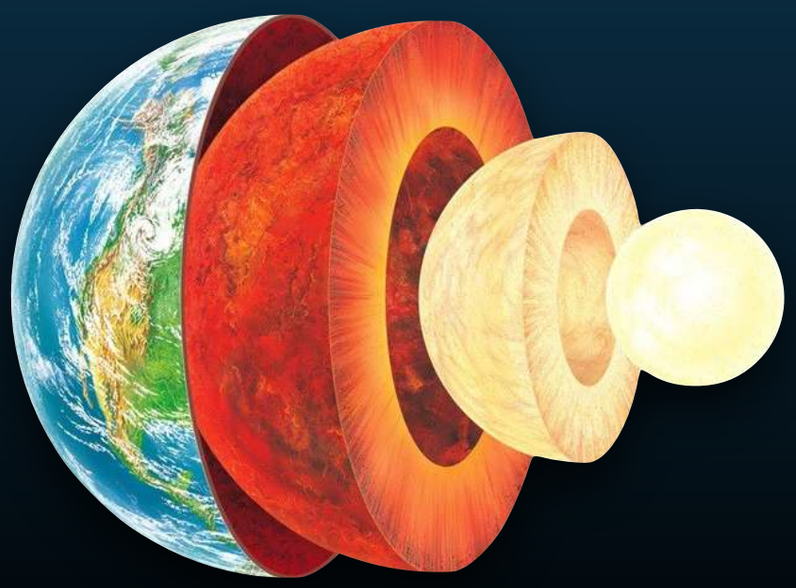
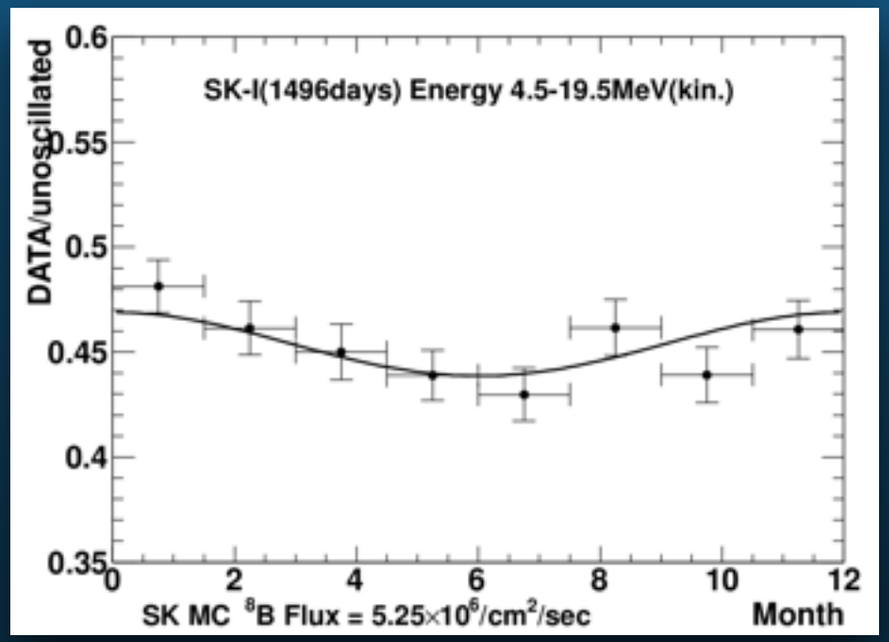




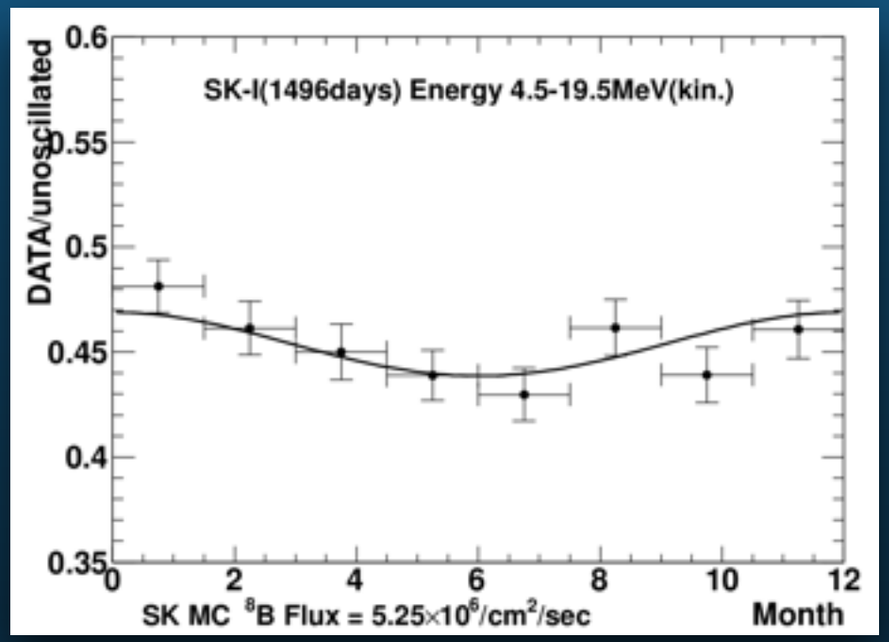
In phase
- SK-I: 1996 - 2001
- SK-II: 2002 - 2005

Out of phase
- SK-III: 2006 - 2008
- SK-IV: 2008 - 2018

SK-I


SK-I(1496days) Energy 4.5-19.5MeV(kin.)
DATA/unoscillated
0.6
0.55
0.5
0.45
0.4
0.35
0
2
4
6
8
10
12
SK MC ^{8}B Flux = 5.25×10^6/cm^2/sec
Month

SK-I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2
4
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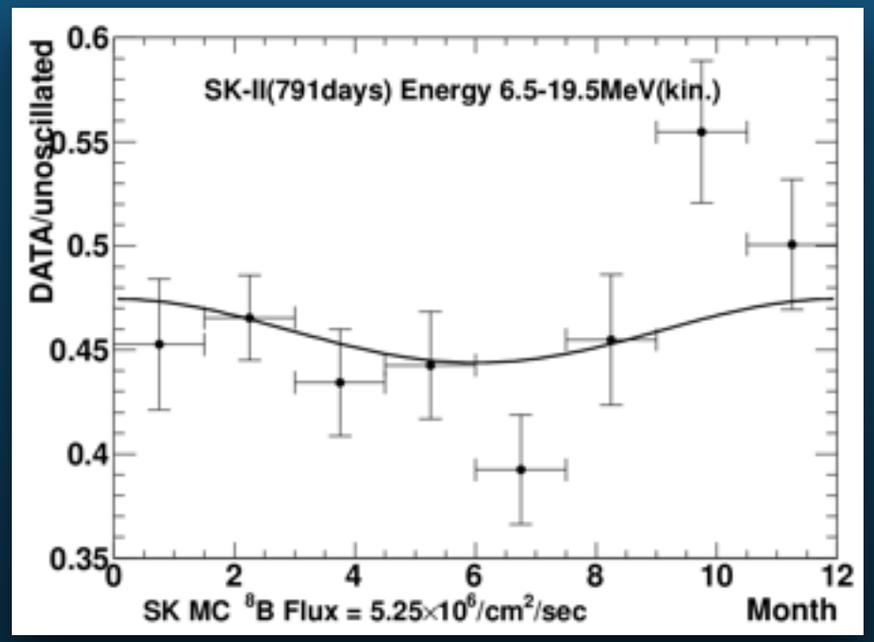
Month

SK-II


SK-II(791days) Energy 6.5-19.5MeV(kin.)
DATA/unoscillated
0.6
0.55
0.5
0.45
0.4
0.35
0
2
4
6
8
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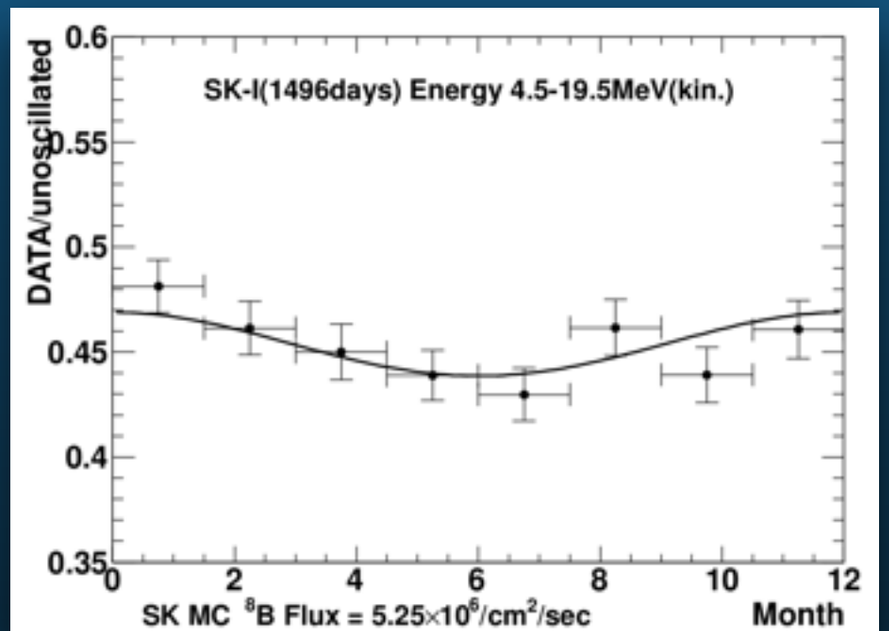
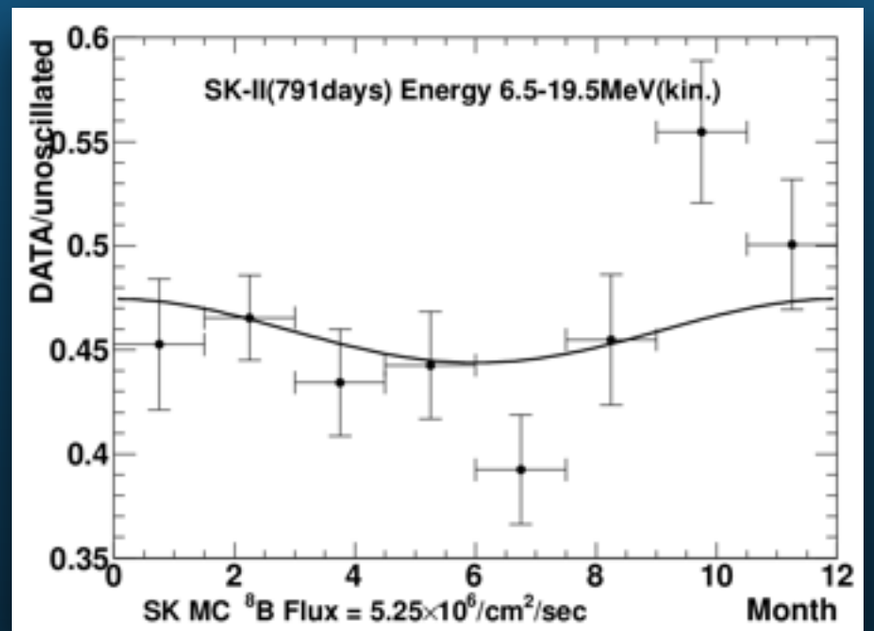
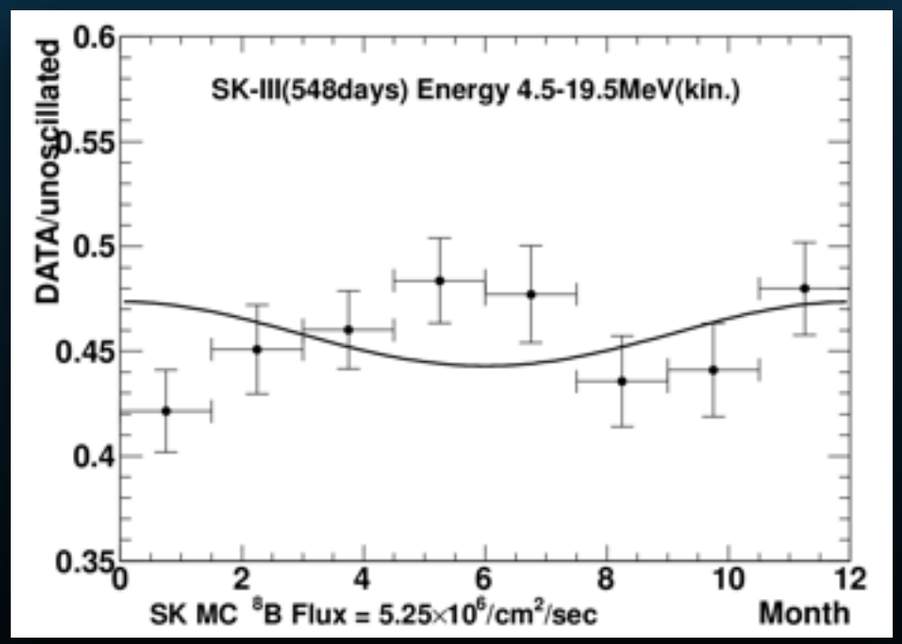


SK-II



SK-III



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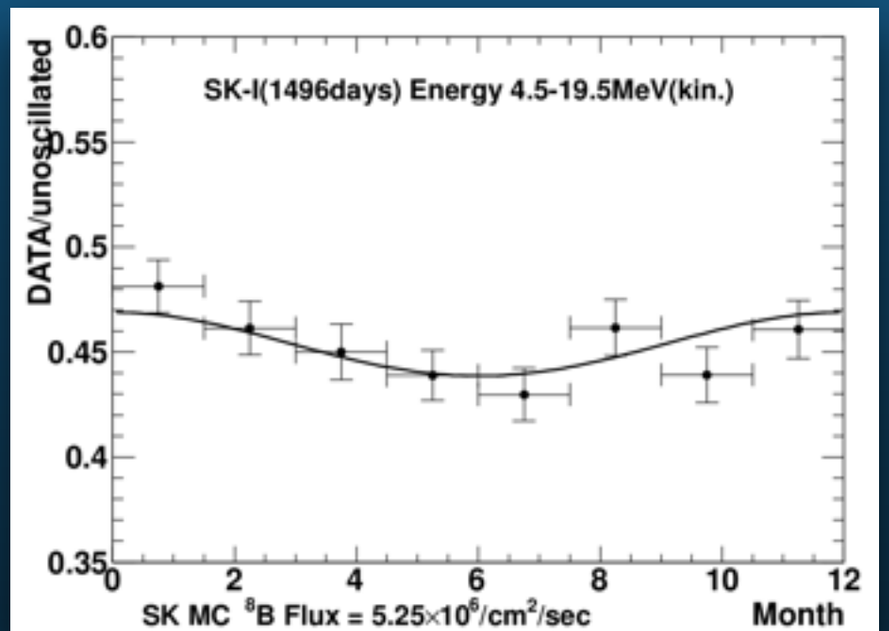

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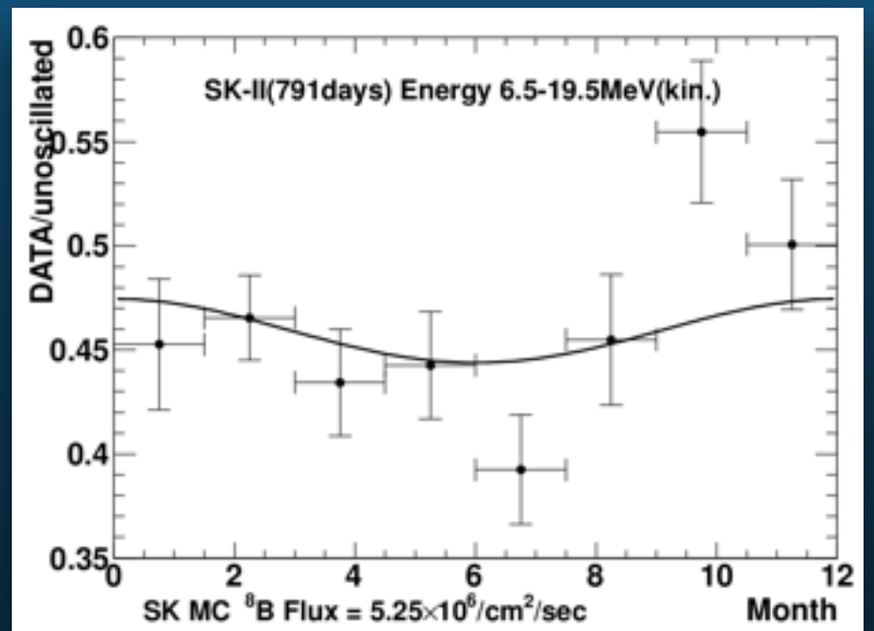

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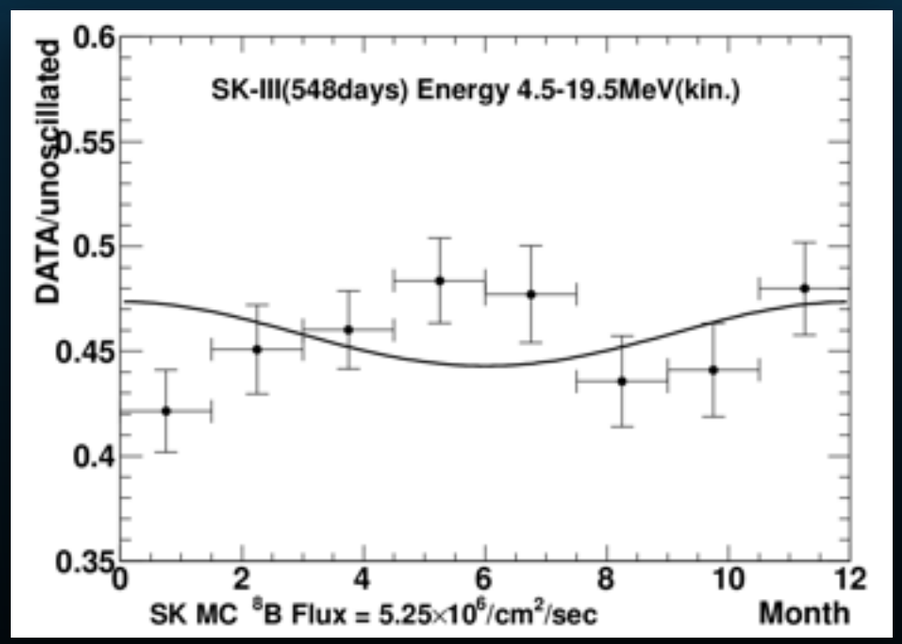
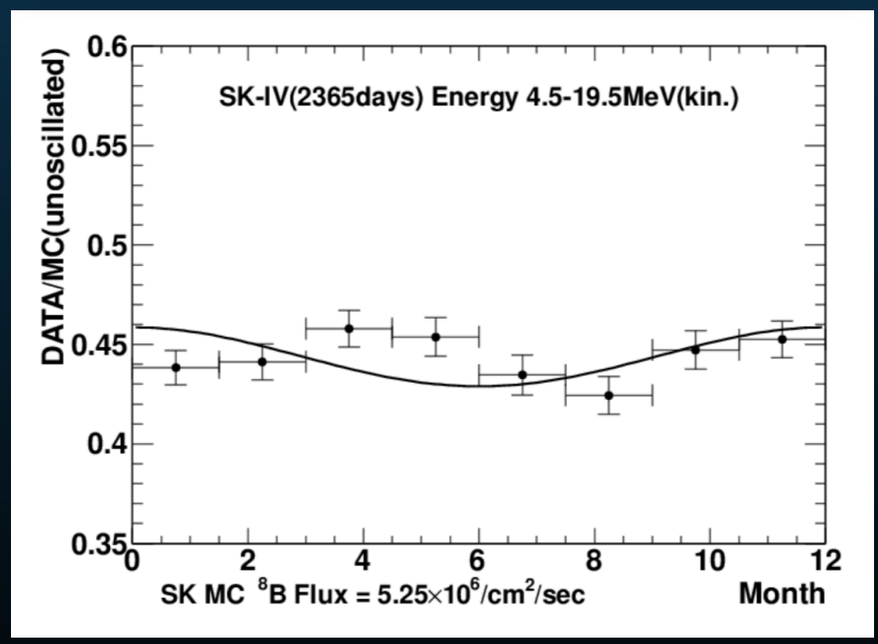
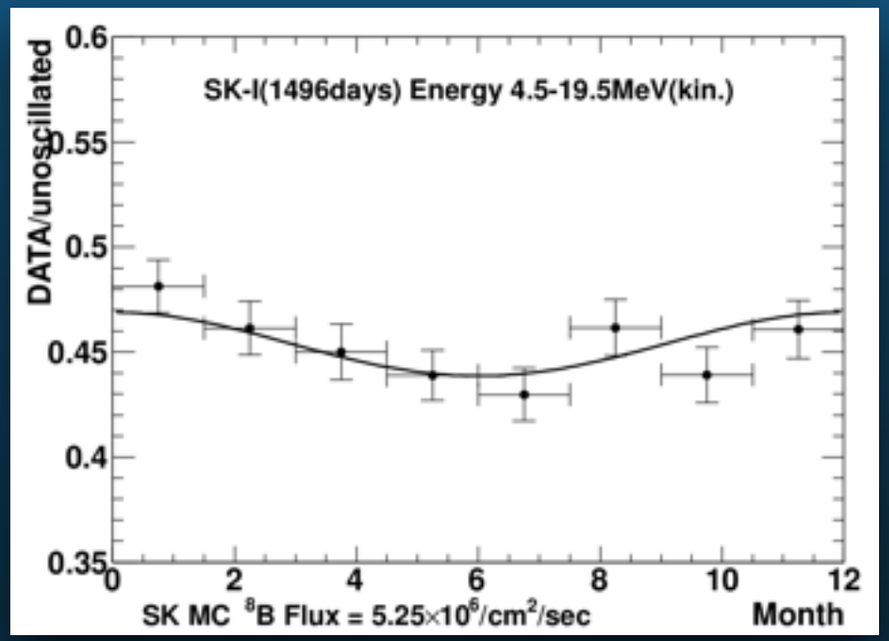
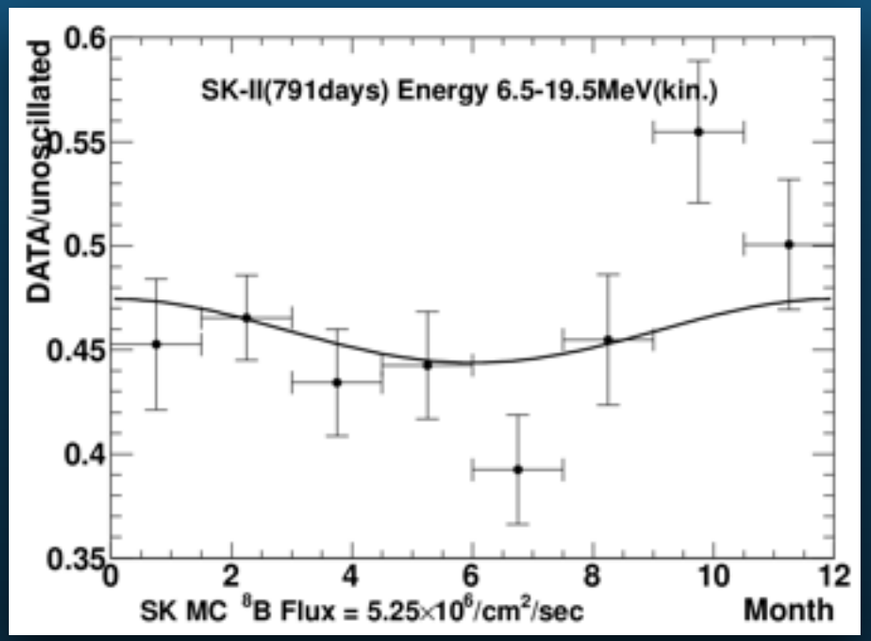


SK-IV



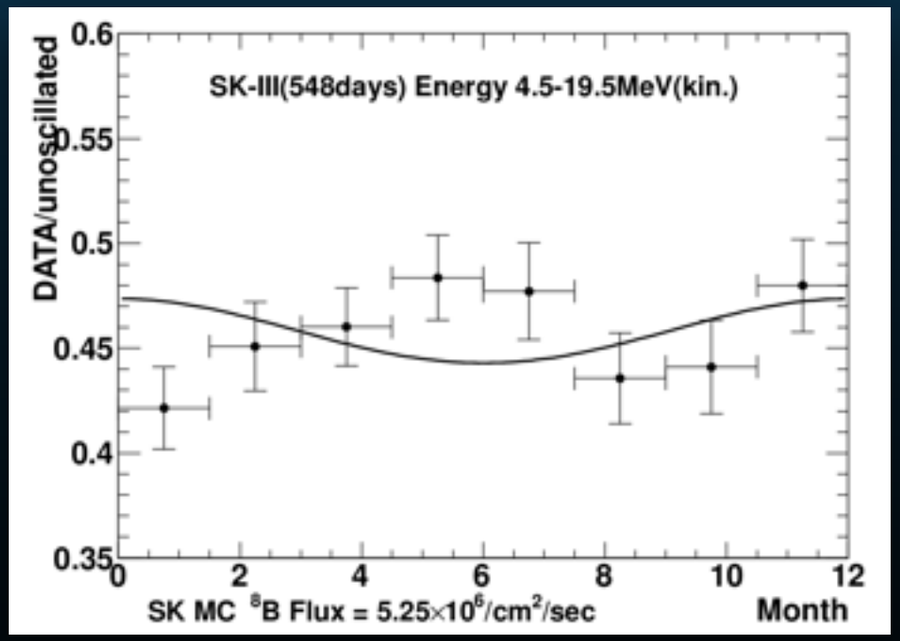
SK-I

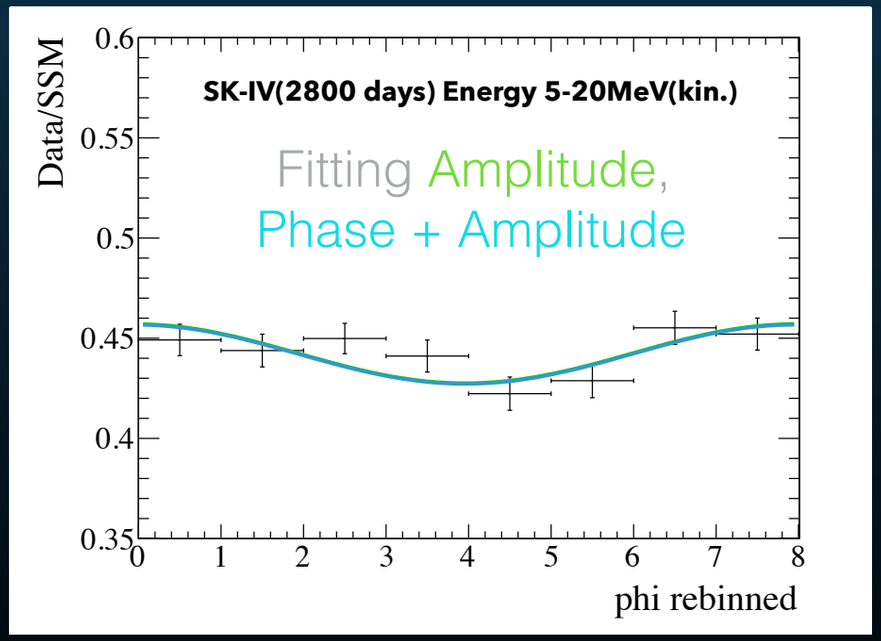




SK-II

SK-III





SK-IV

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