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Thirteen Station Years of ACTS Beacon Observations

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A Preliminary Look at

- **Percent Available Data**
- **2 "Summer" Seasons**
- **2 "Winter" Seasons**
- **2 Years' Statistics**
- **Station by Station Comparison to Crane's Global and 2-Component Models**
- **Summary of Deviations from Models**

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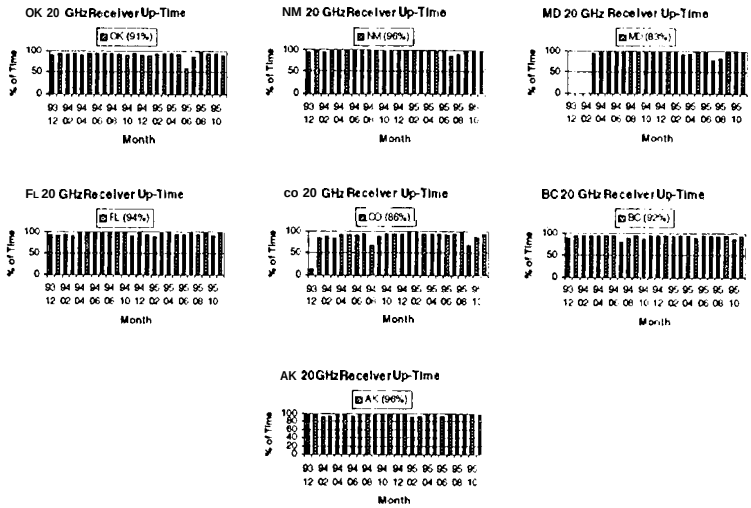

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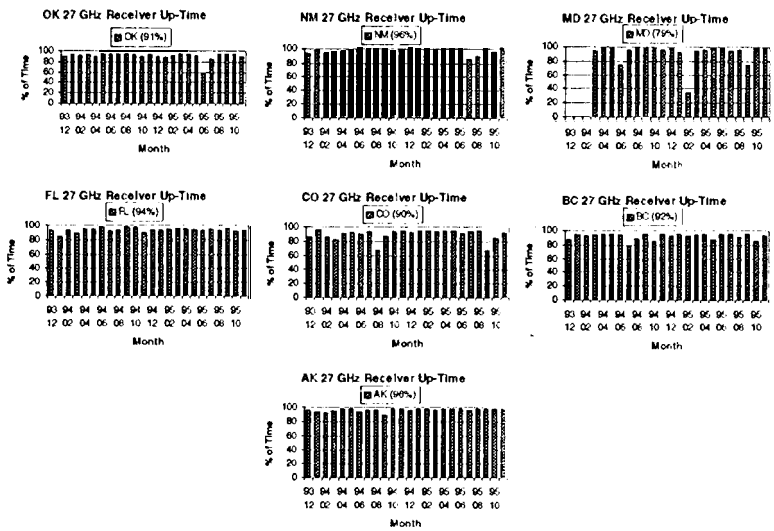

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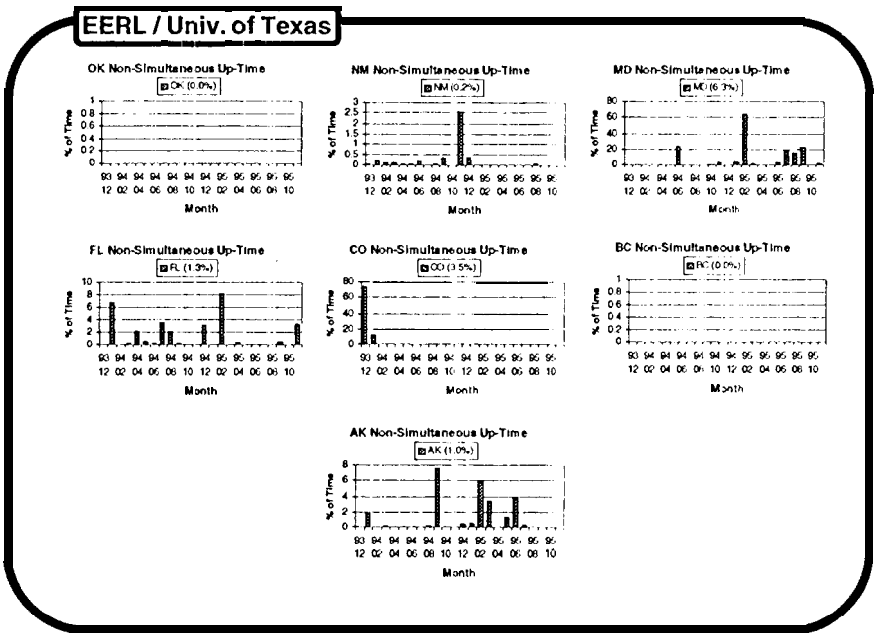
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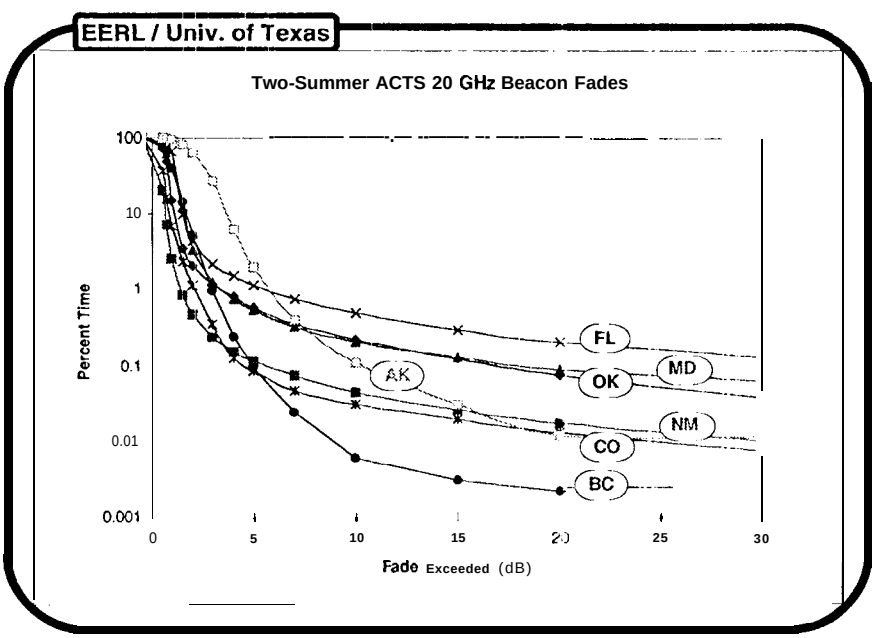
OK Non-Simultaneous Up-Time
NM Non-Simultaneous Up-Time
MD Non-Simultaneous Up-Time
FL Non-Simultaneous Up-Time
CO Non-Simultaneous Up-Time
BC Non-Simultaneous Up-Time
AK Non-Simultaneous Up-Time
% of Time
Month

5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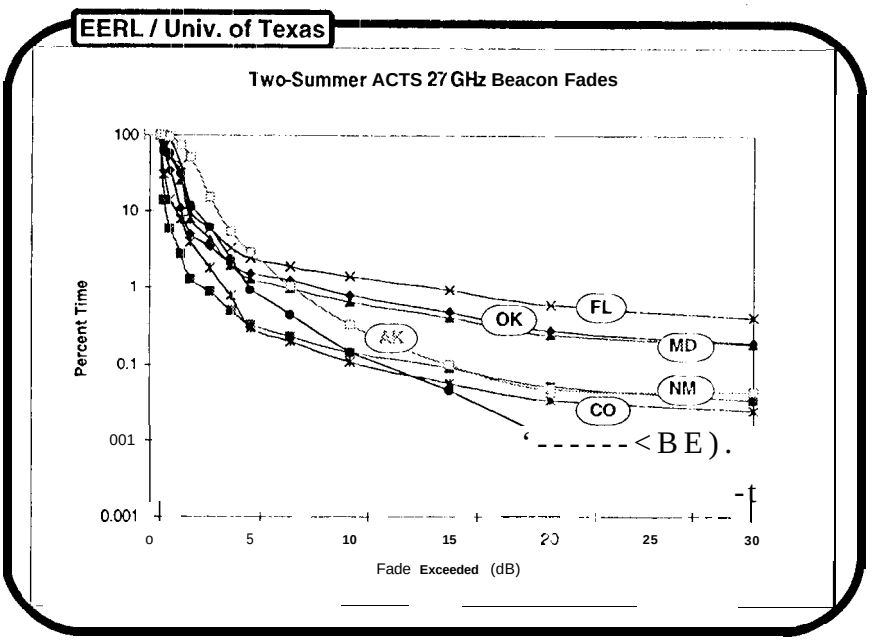
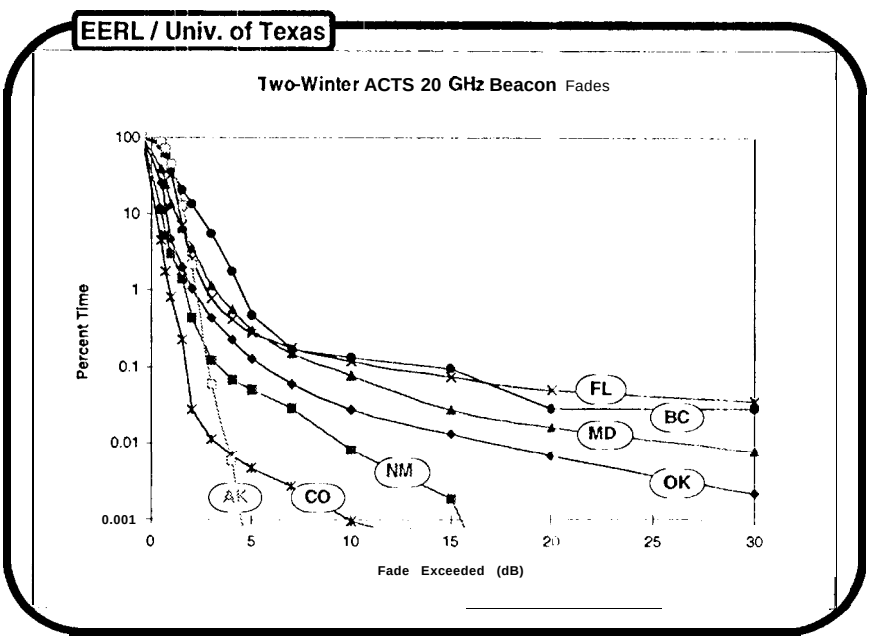
Two-Summer ACTS 20 GHz Beacon Fades
Percent Time
100
10
1
0.1
0.01
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
MD
OK
AK
NM
CO
BC

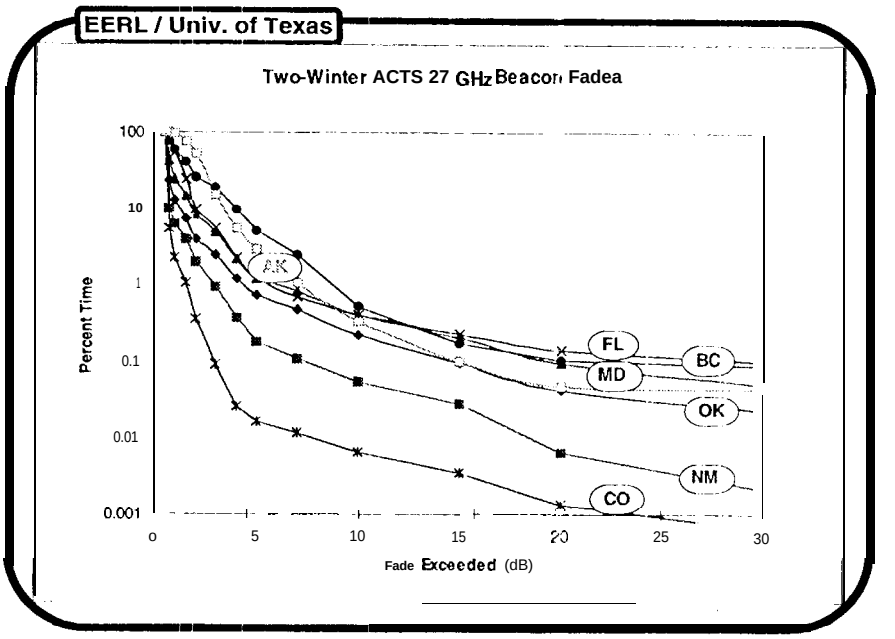
6


EERL / Univ. of Texas
Two-Summer ACTS 27 GHz Beacon Fades
Percent Time
100
10
1
0.1
001
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
OK
AK
MD
NM
CO

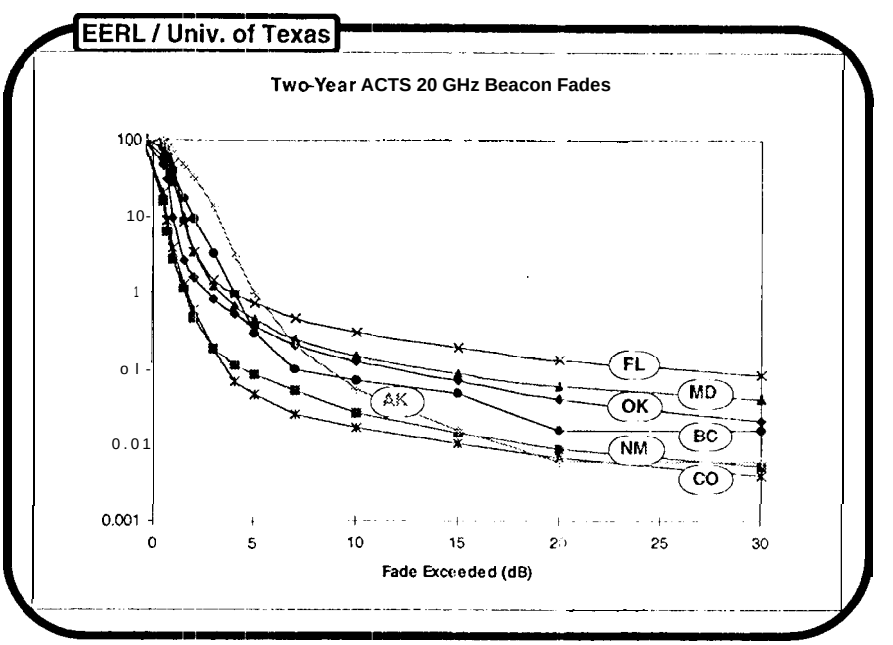
7


EERL / Univ. of Texas
Two-Winter ACTS 20 GHz Beacon Fades
Percent Time
100
10
1
0.1
0.01
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
BC
MD
OK
NM
AK
CO

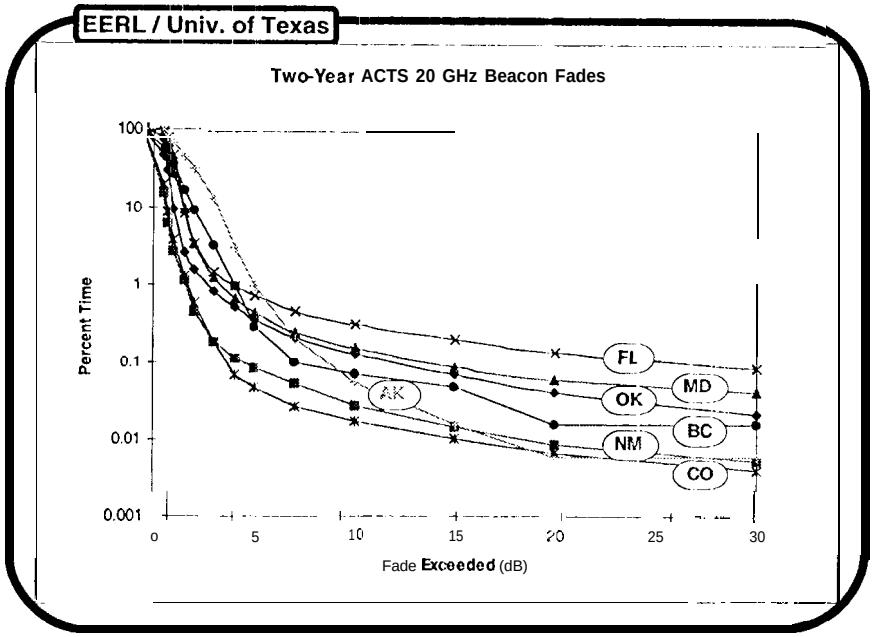
8


EERL / Univ. of Texas
Two-Winter ACTS 27 GHz Beacon Fadea
Percent Time
100
10
1
0.1
0.01
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
AK
FL
BC
MD
OK
NM
CO

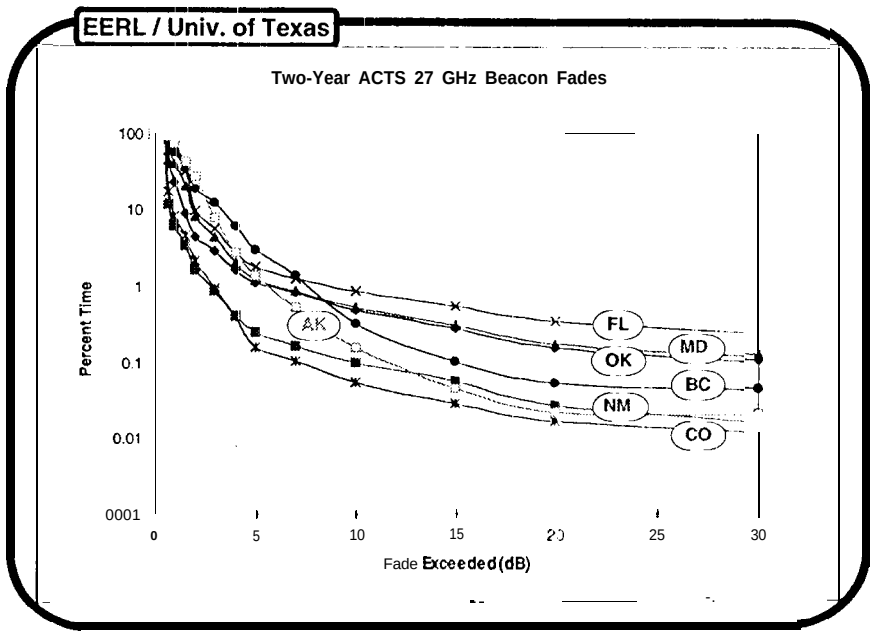
9


EERL / Univ. of Texas
Two-Year ACTS 20 GHz Beacon Fades
100
10
1
0.1
0.01
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
MD
OK
AK
BC
NM
CO

10


EERL / Univ. of Texas
Two-Year ACTS 20 GHz Beacon Fades
Percent Time
100
10
1
0.1
0.01
0.001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
MD
OK
BC
NM
CO
AK

11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Two-Year ACTS 27 GHz Beacon Fades
Percent Time
100
10
1
0.1
0.01
0001
0
5
10
15
20
25
30
Fade Exceeded (dB)
FL
MD
OK
BC
NM
CO
AK

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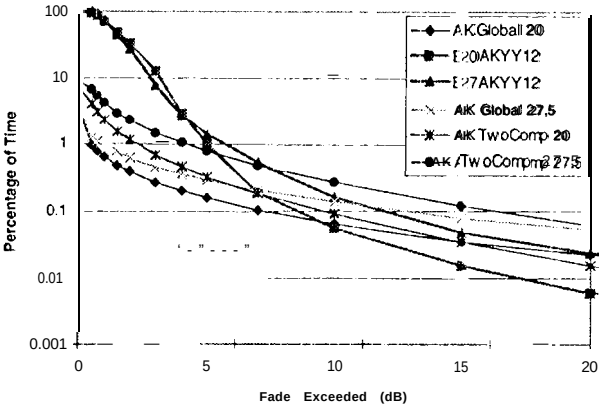
AK vs Models



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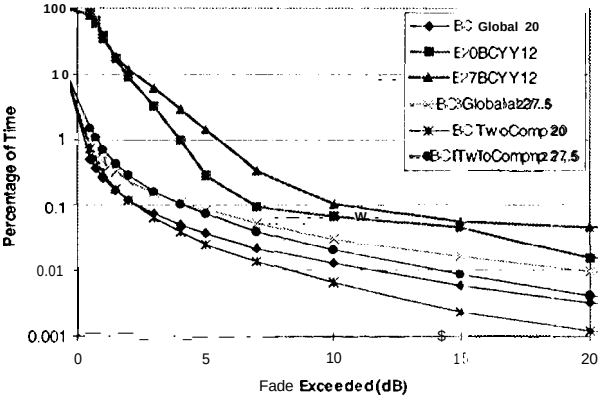
BC vs. Models



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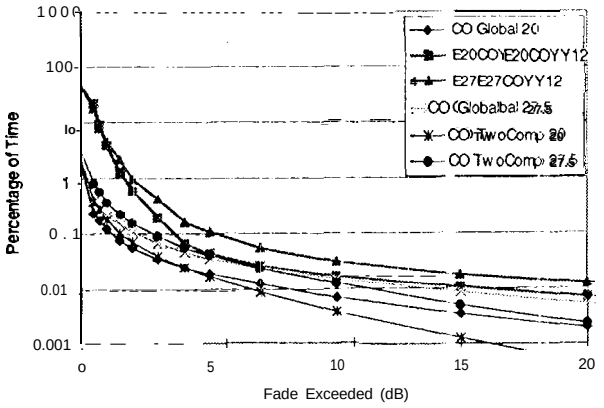
CO vs Models



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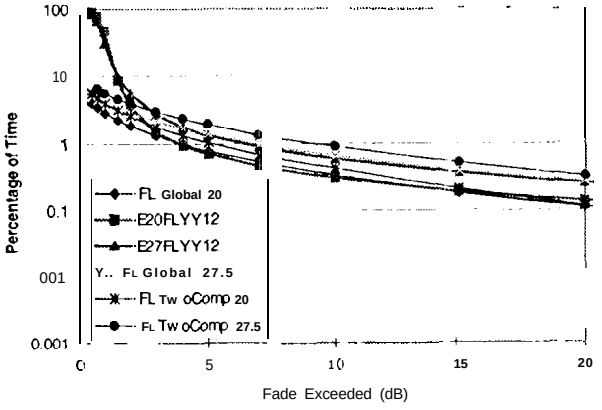
FL vs. Models



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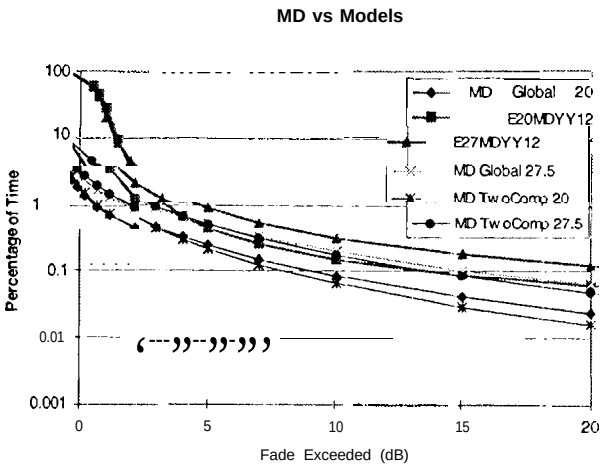

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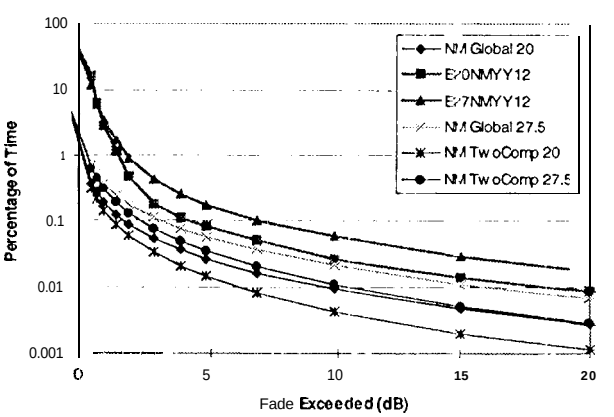

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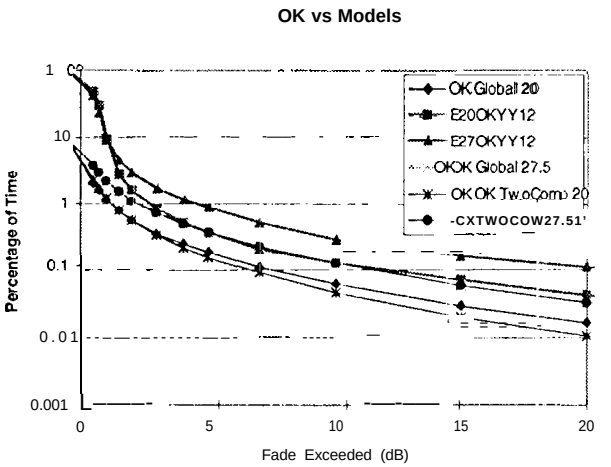

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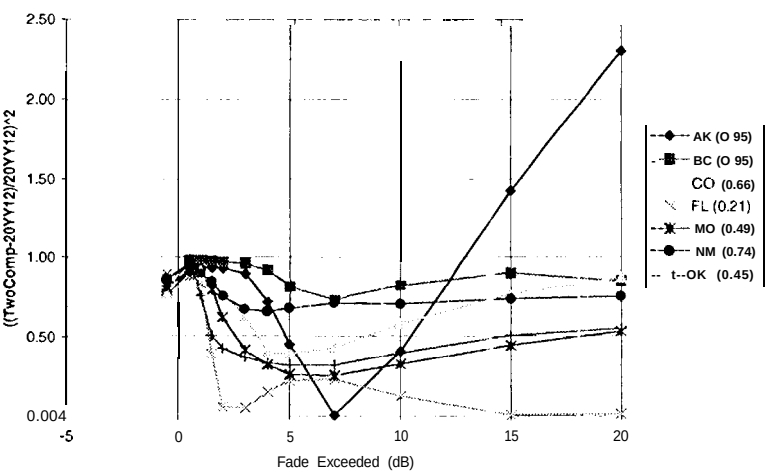

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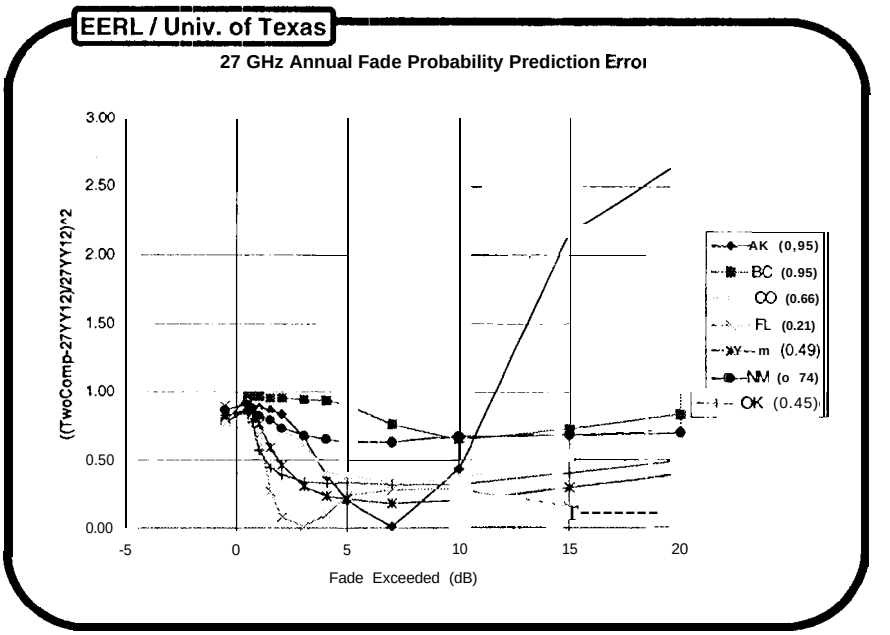
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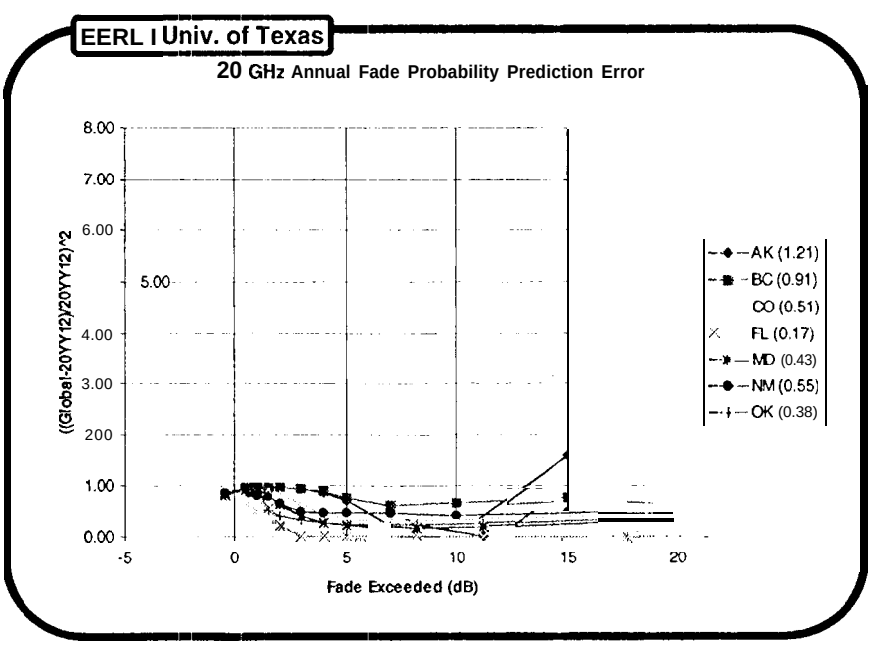
27 GHz Annual Fade Probability Prediction Error
((TwoComp-27YY12)/27YY12)^2
3.00
2.50
2.00
1.50
1.00
0.50
0.00
-5
0
5
10
15
20
Fade Exceeded (dB)
AK (0,95)
BC (0.95)
CO (0.66)
FL (0.21)
m (0.49)
NM (o 74)
OK (0.45)

21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20 GHz Annual Fade Probability Prediction Error
((Global-20YY12)/20YY12)^2
8.00
7.00
6.00
5.00
4.00
3.00
200
1.00
0.00
-5
0
5
10
15
20
Fade Exceeded (dB)
AK (1.21)
BC (0.91)
CO (0.51)
FL (0.17)
MD (0.43)
NM (0.55)
OK (0.38)

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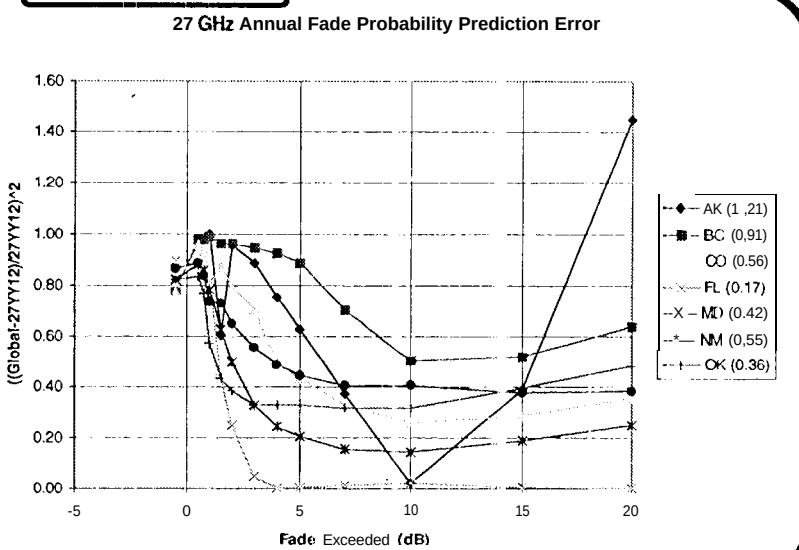

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Conclusion

- The US propagation data base has been significantly expanded
- West coast distribution function shape is different (more mass in low range)
- Models tend to under-predict fading, but best fit in Florida

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