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title '1 Vcf*Hcf factorial model,25degrees FULL';
title2 'based on Bolker et al, TREE use LaPlace likelihood approximation and based on
Steve Dunham, ddfm=bw';
Proc glimmix data=companalysis method=laplace;
where Horiz ne Vert;
class Temp Horiz Vert Vcf Hcf VkillH_any HkillV_any;
model Out_V (event='1') = Vcf Hcf Vcf*Hcf / ddfm=bw link=logit dist=binary;
*random Vert(Vcf) Horiz(Hcf);
random Horiz/group=Hcf;
random Vert /group=Vcf;
covtest / wald;
lsmeans Vcf Hcf Vcf*Hcf / pdiff OR adjust=tukey ilink CL;
nloptions tech=nrridg maxiter=500;
run;

```

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title '2 Vcf*Hcf factorial model,25degrees test uneq var Horiz(Hcf)';
title2 'based on Bolker et al, TREE use LaPlace likelihood approximation and based on
Steve Dunham, ddfm=bw';
Proc glimmix data=companalysis method=laplace;
where Horiz ne Vert;
class Temp Horiz Vert Vcf Hcf VkillH_any HkillV_any;
model Out_V (event='1') = Vcf Hcf Vcf*Hcf / ddfm=bw link=logit dist=binary;
*random Vert(Vcf) Horiz(Hcf);
random Horiz(Hcf);
random Vert /group=Vcf;
covtest / wald;
lsmeans Vcf Hcf Vcf*Hcf / pdiff OR adjust=tukey ilink CL;
nloptions tech=nrridg maxiter=500;
run;

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title '3 Vcf*Hcf factorial model,25degrees test overall effect Horiz(Hcf)';
title2 'based on Bolker et al, TREE use LaPlace likelihood approximation and based on
Steve Dunham, ddfm=bw';
Proc glimmix data=companalysis method=laplace;
where Horiz ne Vert;
class Temp Horiz Vert Vcf Hcf VkillH_any HkillV_any;
model Out_V (event='1') = Vcf Hcf Vcf*Hcf / ddfm=bw link=logit dist=binary;
*random Vert(Vcf) Horiz(Hcf);
random Vert /group=Vcf;
covtest / wald;
lsmeans Vcf Hcf Vcf*Hcf / pdiff OR adjust=tukey ilink CL;
nloptions tech=nrridg maxiter=500;
run;

```

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title '4 Vcf*Hcf factorial model,25degrees test uneq var Vcf';
title2 'based on Bolker et al, TREE use LaPlace likelihood approximation and based on
Steve Dunham, ddfm=bw';
Proc glimmix data=companalysis method=laplace;
where Horiz ne Vert;
class Temp Horiz Vert Vcf Hcf VkillH_any HkillV_any;
model Out_V (event='1') = Vcf Hcf Vcf*Hcf / ddfm=bw link=logit dist=binary; *random
Vert(Vcf) Horiz(Hcf);
random Horiz/group=Hcf;
random Vert(Vcf);
covtest / wald;
lsmeans Vcf Hcf Vcf*Hcf / pdiff OR adjust=tukey ilink CL;
nloptions tech=nrridg maxiter=500;
run;

```

```

title '5 Vcf*Hcf factorial model,25degrees test uneq var Vcf';
title2 'based on Bolker et al, TREE use LaPlace likelihood approximation and based on
Steve Dunham, ddfm=bw';

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```
Proc glimmix data=companalysis method=laplace;  
where Horiz ne Vert;  
class Temp Horiz Vert Vcf Hcf VkillH_any HkillV_any;  
model Out_V (event='1') = Vcf Hcf Vcf*Hcf / ddfm=bw link=logit dist=binary;  
*random Vert(Vcf) Horiz(Hcf);  
random Horiz/group=Hcf;  
covtest / wald;  
lsmeans Vcf Hcf Vcf*Hcf / pdiff OR adjust=tukey ilink CL;  
nloptions tech=nrridg maxiter=500;  
run;
```