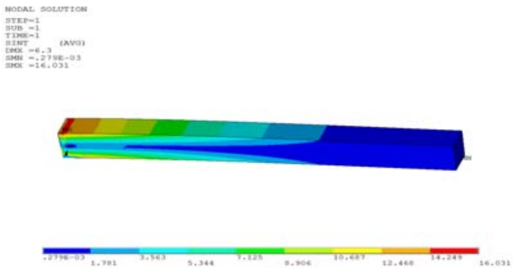

Figure 2 Stress intensity map

B. *Select the maximum stress MAXSTRESS fatigue life N,fatigue damage D,the performance function Z is the output variable , using the MC method , Latin Hypercube random sample of 5000 .*

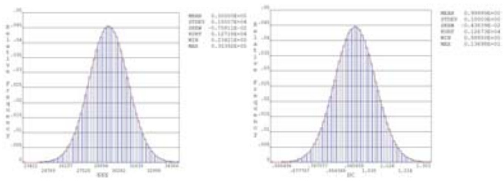

Figure 3 e、Dc histogram

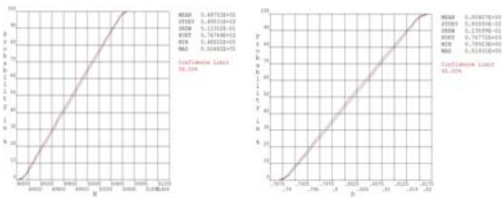

Figure 4 N、D cumulative distribution function map

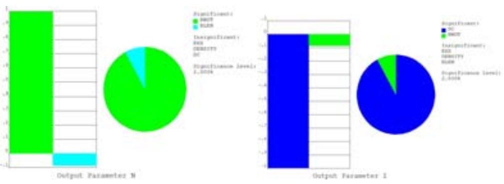

Figure5 N、Z the probability of sexual sensitivity

By the probability histogram of the design results can be seen , close to the elastic modulus e and Dc discrete probability function curve , relatively smooth and there are no major gaps , we can see that the random variable changes the situation stabilized , indicating that the simulation of a sufficient number the results of convergence, more accurate analysis of the probability of failure and reliable indicators .A random variable of mean , standard deviation, skewness , peak data sets as well as extreme value related data can be extracted from these figure , but also calculate the life N the logarithm of the mean $\mu_N = 10.815$ logarithmic deviation $\sigma_N = 0.00996$, the logarithm of the mean of the damage D is $\mu_D = -0.218$, logarithmic deviation $\sigma_D = .00996$, the logarithmic mean value into the formula $\mu_D = \ln n - \mu_N$, draw -0.218=ln40000 - 10.815 ,just to satisfy the formula , and $\sigma_N = \sigma_D$, we can see N, D , are subject to the lognormal , in accord with probabilistic Miner's Rule,and the maximum stress MAXSTRESS fatigue life N , the fatigue damage D kurt (peak) of data sets is almost the same .Probability sensitive graph shows , the most sensitive factor affecting the fatigue life N is a sectional dimensions of the concrete beams and wide (The width equal) , and is a positive relationship between the two fitting coefficients 0.9950 , affect the performance function Z of the most sensitive factors need to be determined by experiment , Dc, scatter plot shows the D and section size of an inverse relationship with changes in fatigue life is the opposite , in line with the Miner theory .The same time, the probability calculation results show that the failure probability of 2.5548% , 97.4452% reliability , a reliable indicator of $\beta = \Phi^{-1}(1 - P_f) = \Phi^{-1}(0.974452) = 1.95$, In addition, the cumulative distribution function in Figure query failure probability of fatigue life and damage .

V. CONCLUSION

(1) Miner ' theory can be used to estimate the mean life of the concrete beams , random sampling method with MCS is a manifestation of the theory of probability Miner , the sampling results show that the distribution of N and D correspond to the theory of probability Miner , then the stochastic finite element method in fatigue the practicality of the problem .

(2) By the results of probabilistic design sensitivity , scatter shows that the cross-section dimensions of concrete cantilever beam is wide and high impact on the fatigue life is proportional to the relationship , followed by the length of the concrete beams , but the fatigue life and the length of an inverse relationship , damage on the contrary, in order to ensure the reliability of the concrete beams to meet the requirements of reasonable option sectional dimension is the key .

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