

Fig.14 The vectorization image

C. Analysis of result

For the above image, isobars share 2837 pixels, accounting for 3.78% of the image. The number of points to describe Fig.14 is 217, so the achieved compression ratio is 13.0737.

In order to analyze the vectorization result, another image which is less interfered by annotations is experimented. The original image is shown in Fig.15, isobars occupy 2436 points, take the proportion of 4.54% of the image. The vectorization result of isobars is shown in Fig16.

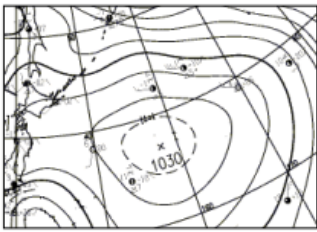


Fig.15 The original image for vectorization

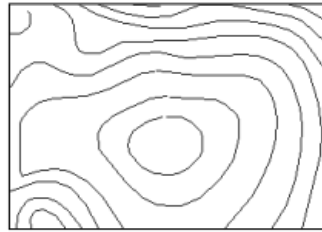


Fig.16 The result of vectorization

In this paper, compression ratio and similarity are chosen to evaluate vectorization results. During the process of vectorization, different threshold value d will result in different compression ratio and similarity, as shown in Tab.1.

Tab.1 The relationship between threshold value d and compression ratio and similarity

threshold value d	1	2	2.5	3	5
compression ratio of Fig.14	8.37	13.08	14.62	15.42	19.70
Similarity of Fig.14	0.98	0.98	0.97	0.97	0.95
compression ratio of Fig.16	9.79	13.61	15.72	17.28	20.64
Similarity of Fig.16	0.98	0.97	0.96	0.96	0.94

As Tab.1 shows, the larger the threshold value is the greater compression ratio. But when the threshold value is too large, the vectorization information will be distorted, losing

some details of isobar. So considering the compression ratio and accuracy simultaneously, the distance threshold value d is finally set to be 2 in this paper.

IV . Conclusion

In this paper, an algorithm for meteorological facsimile map vectorization is proposed. By extracting annotations and vectoring isobars, the information related to isobars is successfully extracted. Noises in the map are removed and broken lines are connected by means of α - β filtering before extracting information from isobars in detail. Then the extracted isobars are approximated by polygonal lines and denoted by the coordinates position of the turning points. Thus the map is converted from its original bitmap format into vector format and can easily be stored and displayed together with other navigation information.

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