

POLIGONOMETRIYA YO‘LINI O‘TKAZISHDA OLINGAN DALA O‘LCHASH NATIJALARINI TENGLASHTIRISH VA UNING PUNKTLARI KOORDINATALARINI HISOBLASH

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Annotatsiya: Ushbu maqolada poligonometriya yo‘lini o‘tkazishda olingan o‘lchash natijalarini tenglashtirish punktlar koordinatalari hisoblash va topish, o‘lchangan qiymatlarga mos ravishda tuzatmalar kiritish, ishchi sxemalarini tuzish va boshqalar haqida aytib o‘tilgan.

Kalit so‘zlar: Poligonometriya, chekli xato, tenglashtirish, punktlar, koordinatalari hisoblash, o‘lchangan qiymatlar, sxema, sistema, aniqlik, kattalik, masshtab.

EQUIPMENT OF FIELD MEASURES RECEIVED IN POLYGONOMETRY ROAD AND CALCULATION OF COORDINATES OF ITS POINTS

Abstract: This article deals with the calculation and finding the coordinates of the points of equalization of the measurement results obtained during the polygonometry path, making corrections in accordance with the measured values, drawing up working schemes and more.

Keywords: Polygonometry, finite error, equation, points, calculation of coordinates, measured values, scheme, system, accuracy, magnitude, scale.

Poligonometriya yo‘lini o‘tkazishda punkt koordinatalarini hisoblash uchun faqat kerakli o‘lchashlarning o‘zigina emas, balki, berilayotgan yo‘lni hisoblashda zarur

bo‘ladigan ya’ni kattaliklar bilan matematik aloqalarida aniqlashda topiladigan ayrim ortiqcha kattaliklar o‘lchashlari ham bajariladi.

Ortiqcha o‘lchashlarning borligi o‘lchangan kattaliklarni tenglashtirish ishlarini bajarish zaruratini keltirib chiqaradi. [1-3]

Poligonometriya yo‘lini tenglashtirish kichik kvadratlar usuli qonuniyatlariga ko‘ra amalga oshiriladi va quyidagi tartibda amalga oshiriladi:

1) tuzatmani quyidagi shartni qanoatlantirgan holda aniqlansa, bu tenglashtirishning qat’iy usullari hisoblanadi

$$[p_{\beta}v_{\beta}^2] + [p_s v_s^2] = \min ; \quad (1)$$

2) agar o‘lchangan burchaklarga va koordinatalar orttirmasiga tuzatmalar ularning o‘zaro munosabatlarini hisobga olmasdan alohida aniqlansa (masalan: f_x va f_y bog‘lanmaslik xatolarini tomon uzunliklariga proporsional tarzda taqsimlansa) bu tenglashtirishning noqat’iy (to‘liq aniq emas) usuli hisoblanadi. [4-8]

Boshlang‘ich hisoblashlar.

Poligonometriya yo‘lidagi boshlang‘ich hisoblashlar ketma-ketligini.

a) burchak bog‘lanmaslik xatolari quyidagi formulalar orqali hisoblanadi:

ochiq poligonometriya yo‘li uchun

$$f_{\beta} = \sum \beta - [(\alpha_{oxirgi} - \alpha_{boshgi}) + 180^0 (n+1)] \quad (2)$$

yopiq poligonometriya yo‘li uchun

$$f_{\beta} = \sum \beta - 180^0 (n-2) \quad (3)$$

Olingan kattalikni chekli qiymat bilan quyidagi formula orqali solishtiriladi*

$$f_{\beta_{chekli}} = 2m_{\beta} \sqrt{n+1} \quad (4)$$

Burchak o‘lchash o‘rta kvadratik xatoligi kattaligi, tegishli klass yoki razryadga-poligonometriyaga oid instruktsiyadan olinadi. SHuning uchun quyidagi nisbat qanoatlanishi kerak

$$f_{\beta} \leq f_{\beta_{chekli}} \quad (5)$$

Agar keyingi tenglashtirish hisoblashlarida burchak bog‘lamaslik xatosi uchun tuzatma kiritish talab etilsa, u holda bog‘lanmaslikni quyidagi tuzatmalarni hisoblash bilan har bir burchaklarga teng taqsimlanadi

$$v_{\beta_i} = -\frac{f_{\beta}}{n+1} \quad (6)$$

b) koordinata ottirmalaridagi bog‘lanmaslikni hisoblash. Buning uchun birinchi navbatda direksion burchaklar topiladi

$$\alpha_{i+1} = \alpha_i \pm 180^0 + \beta_{chap} \quad (7)$$

yoki

$$\alpha_{i+1} = \alpha_i \pm 180^0 - \beta_{o'ng} \quad (8)$$

bu yerda, α_i va α_{i+1} -oldingi va keyingi chiziqlarning direksion burchaklari,

β_{chap} va $\beta_{o'ng}$ -tuzatilgan(yoki bog‘lanmaslik uchun tuzatilmagan) chap va o‘ng burilish burchaklari. [9-15]

So‘ngra quyidagi formulalar orqali koordinata ottirmalari olinadi

$$\left. \begin{aligned} \Delta x_i &= s_i \cos \alpha_i \\ \Delta y_i &= s_i \sin \alpha_i \end{aligned} \right\} \quad (9)$$

va orttirmalardagi bog‘lanmaslik xatolari f_x va f_y lar hisoblanadi.

Ochiq poligonometriya yo‘li yoki ochiq paligon uchun bog‘lanmaslik xatolari quyidagicha bo‘ladi

$$\left. \begin{aligned} f_x &= \sum \Delta x - (x_{oxirgi} - x_{boshgi}); \\ f_y &= \sum \Delta y - (y_{oxirgi} - y_{boshgi}) \end{aligned} \right\} \quad (10)$$

Yopiq poligonometriya yo‘li yoki yopiq paligon uchun bog‘lanmaslik xatolari quyidagicha bo‘ladi

$$\left. \begin{aligned} f_x &= \sum \Delta x; \\ f_y &= \sum \Delta y \end{aligned} \right\} \quad (11)$$

v) poligonometriya yo‘li(yoki poligoni) chiziqli absolyut f_s va nisbiy $\frac{f_s}{[s]}$

bog‘lanmaslik xatolarini hisoblash.

Poligonometriya yo‘lining bog‘lanmasligi quyidagi formulada aniqlanadi

$$f_s = \sqrt{f_x^2 + f_y^2} \quad (12)$$

va chekli qiymati bilan taqqoslanadi, hamda quyidagicha aniqlanadi

$$f_{s_{chekli}} = 2M \quad (13)$$

Poligonometriya yo‘lining nisbiy bog‘lanmasligi $\frac{f_s}{[s]}$ berilayotgan razryaddagi poligonometriyani tuzish instruktsiyasida ko‘rsatilgan ruhsat etilgan qiymat chegarasidan ortib ketmasligi kerak. [16-17]

Hisoblashlardan x va y koordinatalar quyidagi formulalar bilan olinadi

$$\left. \begin{aligned} x_{i+1} &= x_i + \Delta x_{i_{\text{muzatilgan}}} \\ y_{i+1} &= y_i + \Delta y_{i_{\text{muzatilgan}}} \end{aligned} \right\} \quad (14)$$

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