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المستخلص

في هذه الدراسة تم عمل المعادلات الاساسية باستخدام طريقة العنصر المحدد للجملونات الفراغية وقد استخدمت هذه المعادلات لعمل برنامج في الماتلاب, وقد سمي هذا البرنامج بتحليل الجملونات الفراغية باستخدام برنامج الماتلاب. تم تحليل بعض الجملونات البسيطة باستخدام هذا البرنامج للتاكد من فعالية البرنامج, وايضا تم تحليل نفس الجملونات بواسطة برنامج الساب 2000 وقد وجدت النتائج متطابقة.

ABSTRACT

In this study the Finite Element formulation for space trusses was modeled in MATLAB Program Language. The modeled Program named **A**nalysis of **S**pace **T**russ by using **M**ATLAB **P**rogram language **(ASTMP)**. Numerical examples were used in order to check the **(ASTMP**) program. The results obtained by **ASTMP** were also verified by using structural analysis software program SAP2000 and were found to be acceptable.

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E - Young’s Modulus.

A - Cross-sectional area of an element.

L - Length of an element.

$[k^e]$ - Element stiffness matrix in the local coordinate system.

{u} - Element displacements in local coordinate system.

{f} - Element nodal force components in local coordinate system.

[K] - Element stiffness matrix in the global coordinate system.

{U} - Element displacement vector in global coordinate system.

{F} - Element nodal force vector components in global coordinate system.

N_i - Shape function for node i.

u_i - Nodal displacement at nodes at local coordinate system.

U_i - Displacement at joints in global coordinate system.

δu - virtual displacement.

P - Axial load.

ε_x - Strain component.

[T] - Transformation matrix.

[K] - Element stiffness matrix in the global coordinate system.