

Analisis eksperimental sudut puntir dan pusat geser pada balok kanal terbuka akibat momen puntir = Experimental analysis of torsion angle and shear center at open channel beams due to moment torsion

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20388626&lokasi=lokal>

Abstrak

[Sejak tahun 2003 diperkenalkan sebuah teori baru mengenai torsi yang disebut dengan modèle couple dimana dalam teori tersebut dinyatakan momen torsi yang bekerja pada balok-tipis penampang terbuka (open cross-section thin-walled) berhubungan erat dengan bending momen sehingga menyebabkan penyimpangan sudut torsi dan shear center mengalami displacement searah sumbu horisontal. Teori ini membantah teori klasik VZ. Vlasov yang menyatakan tidak ada displacement pada shear center. Teori modèle couple ini masih dikembangkan hingga tahun 2012 dengan pembuktian secara eksperimental dan numerik. Hasil pembuktian itu ternyata mendukung teori modèle couple. Dari studi pustaka dan penelitian pendahuluan didapati beberapa kekurangan dalam prosedur eksperimental. Berdasarkan hal tersebut, maka dilakukan penelitian kembali dengan memperbaiki prosedur eksperimen sekaligus ingin membuktikan apakah hasil eksperimental sesuai dengan teori Vlasov atau teori modèle couple. Analisis penelitian ini dilakukan dengan membandingkan hasil uji eksperimental, pemodelan numerik menggunakan software, prosedur analisis teori Vlasov untuk

balok-tipis, teori modèle couple dan teori torsi yang umum.

Hasil penelitian ini memperlihatkan sudut torsi dan shear center analisis numerik sesuai dengan teori Vlasov sedangkan hasil uji eksperimental masih sama dengan hasil eksperimental terdahulu yang mendukung teori modèle couple. Walau hasil uji eksperimental ini mendukung teori modèle couple, bukan berarti teorema modèle couple telah terbukti. Untuk itu disampaikan pula saran-saran perbaikan yang perlu dilakukan jika eksperimen serupa akan dilakukan kembali.

Since 2003 introduced a new theory called the torque modèle couple where the theory expressed in torsion moment acting on the open cross-section thin-walled are closely related to the bending moment causing deviation angle of torsion and shear center experienced displacement in the direction of the horizontal axis. This theory denies the classical theory VZ. Vlasov stating there is no displacement of the shear center. Couple modèle theory is still being developed by 2012 with evidence experimentally and numerically. The results turned out to support the theory of proof modèle couple. From the literature study and preliminary research found several deficiencies in the experimental procedures. Based on this, the research conducted again by correcting the experimental procedure at the same time trying to prove whether the experimental results according to Vlasov theory or theories modèle couple. The analysis is done by comparing the test results of experimental, numerical modeling using the software, the analysis procedure Vlasov theory for thinwalled, modèle couple theory and general theory of torque. The results of this study show the torque angle and shear center in accordance with the numerical analysis of Vlasov theory while the experimental test results are still the same as previous experimental results that support the theory modèle couple.

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